WOODSTOCK

SHOP FOX®

INTERNATIONAL

MODEL M1008/M1009
MILL

Model M1008

Model M1009

INSTRUCTION MANUAL

Phone: 1-360-734-3482 • On-Line Technical Support: tech-support@shopfox.biz

#6699TR

Printed in China

WARNING

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement, and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Contents

USE THE QUICK GUIDE PAGE LABELS TO SEARCH OUT INFORMATION FAST!

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INTRODUCTION

Woodstock Technical Support

We stand behind our machines! In the event that questions arise about your machine, parts are missing, or a defect is found, please contact Woodstock International Technical Support at 1-360-734-3482 or send e-mail to: **tech-support@shopfox.biz**. Our knowledgeable staff will help you troubleshoot problems and send out parts for warranty claims.

If you need the latest edition of this manual, you can download it from **http://www.shopfox.biz**.
If you still have questions after reading the latest manual, or if you have comments please contact us at:

Woodstock International, Inc.
Attn: Technical Support Department
P.O. Box 2309
Bellingham, WA 98227

M1008 Specifications

Vertical Motor	2 HP, 110/220V (prewired 220V), Single-Phase, 1725 RPM, 20/10 Amps
Table Size	9-1/2" x 31-1/2"
Vertical Spindle Travel	4-3/4"
Maximum Distance Vertical Spindle to Column	22"
Maximum Distance Vertical Spindle to Table	11"
Table Travel, Longitudinal	15-1/2"
Table Travel, Cross	8-1/2"
Knee Travel	13"
Vertical Head Tilt	90° Both Ways
Work Table Swivel	45° Both Ways
T-Slots	3 @ 1-5/8" Centers, 1/2" Stud
Speed Range	270, 390, 550, 615, 860, 930, 1800, 1960, 2950 RPM
Spindle	R8
Overall Size	41-5/16" L x 41-3/4" W x 80" H
Footprint	20-1/2" x 29-1/2"
Weight	1622 lbs

M1009 Specifications

Vertical Motor	2 HP, 110/220V (prewired 220V), Single-Phase, 1725 RPM, 20/10 Amps
Horizontal Motor	1-1/2 HP, 110/220V (prewired 220V), Single-Phase, 1725 RPM, 16/8 Amps
Table Size	9-1/2" x 39-3/8"
Vertical Spindle Travel	4-3/4"
Maximum Distance Vertical Spindle to Column	26-3/4"
Maximum Distance Vertical Spindle to Table	13-3/8"
Maximum Distance Horizontal Spindle Center to Table	11"
Table Travel, Longitudinal	22"
Table Travel, Cross	8-1/2"
Knee Travel	13"
Vertical Head Tilt	90° Both Ways
Work Table Swivel	45° Both Ways
T-Slots	3 @ 1-5/8" Centers, 1/2" Stud
Speed Range (Vertical Spindle)	270, 390, 490, 615, 860, 930, 1600, 1960, 2950 RPM
Speed Range (Horizontal Spindle)	72, 170, 210, 240, 290, 550, 830, 1300 RPM
Spindles	R8
Overall Size	48-13/16" L x 45-5/8" W x 80-5/16" H
Footprint	20-1/2" x 29-1/2"
Weight	2054 lbs

M1008 Controls and Features

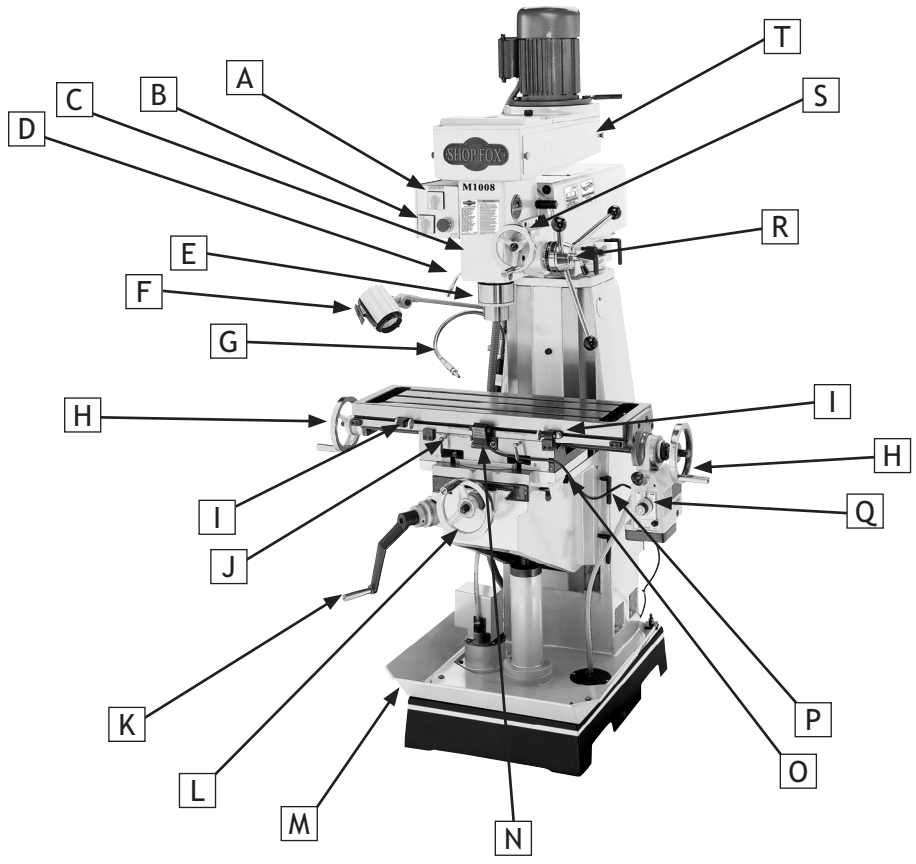

Figure 1. Please take time to become familiar with each term and its location on the machine. These terms will be used throughout the manual and knowing them is essential to understanding the instructions, safety, and terminology used in this manual.

A. Spindle ON/OFF Switch
B. Coolant ON/OFF Switch
C. Vertical Spindle Speed Setting Chart
D. Vertical Quill Travel Lock
E. Vertical Spindle
F. Work Light
G. Coolant Hose
H. Longitudinal Feed Handwheel (2 Places)
I. Powerfeed Hard Stop (2 Places)
J. Longitudinal Feed Lock (2 Places)
K. Knee Feed Handwheel
L. Cross Feed Handwheel
M. Coolant Tray
N. Powerfeed Limit Switch
O. Cross Feed Lock (2 Places)
P. Knee Feed Lock (2 Places)
Q. Powerfeed Controls
R. Quill Feed Handle and Lock
S. Micro-Feed Adjustment Handle
T. Access Panel for Spindle Speed Adjustment

M1009 Controls and Features

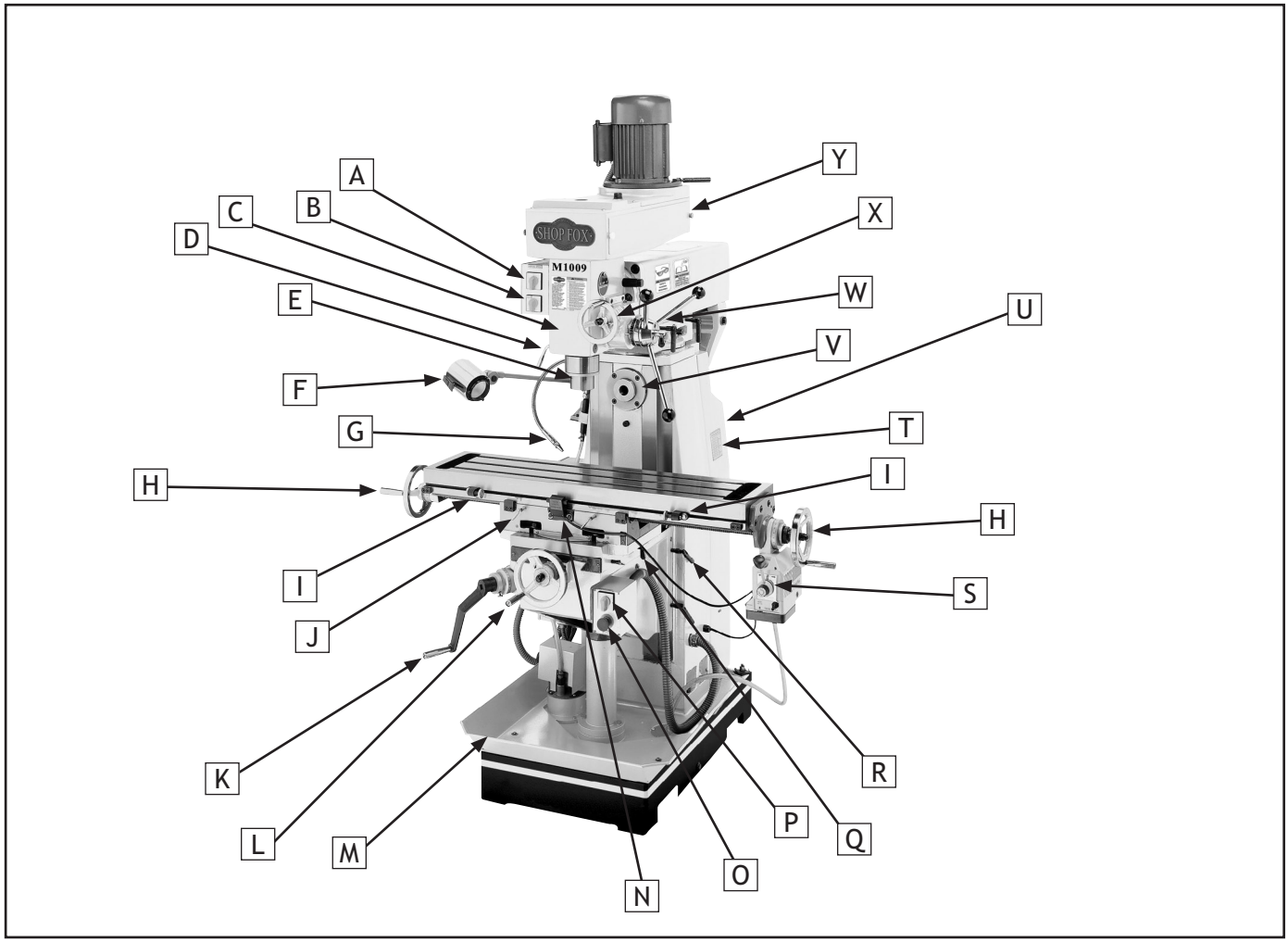

Figure 2. Please take time to become familiar with each term and its location on the machine. These terms will be used throughout the manual and knowing them is essential to understanding the instructions, safety, and terminology used in this manual.

A. Vertical Spindle ON/OFF Switch
B. Coolant ON/OFF Switch
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I. Powerfeed Hard Stop (2 Places)
J. Longitudinal Feed Lock (2 Places)
K. Knee Feed Handwheel
L. Cross Feed Handwheel
M. Coolant Tray
N. Powerfeed Limit Switch
O. Emergency Stop
P. Horizontal Spindle ON/OFF Switch
Q. Cross Feed Lock (2 Places)
R. Knee Feed Lock (2 Places)
S. Powerfeed Controls
T. Horizontal Spindle Speed Setting Chart
U. Access Cover for Horizontal Spindle Speed Adjustment
V. Horizontal Spindle
W. Quill Feed Handle and Lock
X. Micro-Feed Adjustment Handle
Y. Access Panel for Vertical Spindle Speed Adjustment

SAFETY

READ MANUAL BEFORE OPERATING MACHINE. FAILURE TO FOLLOW INSTRUCTIONS BELOW WILL RESULT IN PERSONAL INJURY.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.

NOTICE This symbol is used to alert the user to useful information about proper operation of the equipment, and/or a situation that may cause damage to the machinery.

Standard Safety Instructions

1. **Thoroughly read the Instruction Manual before operating your machine.** Learn the applications, limitations and potential hazards of this machine. Keep the manual in a safe and convenient place for future reference.

2. **Keep work area clean and well lighted.** Clutter and inadequate lighting invite potential hazards.

3. **Ground all tools.** If a machine is equipped with a three-prong plug, it must be plugged into a three-hole grounded electrical receptacle or grounded extension cord. If using an adapter to aid in accommodating a two-hole receptacle, ground using a screw to a known ground.

4. **Wear eye protection at all times.** Use safety glasses with side shields or safety goggles that meet the appropriate standards of the American National Standards Institute (ANSI).

5. **Avoid dangerous environments.** Do not operate this machine in wet or open flame environments. Airborne dust particles could cause an explosion and severe fire hazard.

6. **Ensure all guards are securely in place** and in working condition.

7. **Make sure switch is in the *OFF* position** before connecting power to machine.

8. **Keep work area clean,** free of clutter, grease, etc.

9. **Keep children and visitors away.** Visitors must be kept at a safe distance while operating unit.

10. **Childproof your workshop** with padlocks, master switches or by removing starter keys.

11. **Stop and disconnect the machine when cleaning, adjusting or servicing.**

12. **Do not force tool.** The machine will do a safer and better job at the rate for which it was designed.

13. **Use correct tool.** Do not force machine or attachment to do a job for which it was not designed.

14. **Wear proper apparel.** Do not wear loose clothing, neck ties, gloves, jewelry, and secure long hair away from moving parts.

15. **Remove adjusting keys, rags, and tools.** Before turning the machine on, make it a habit to check that all adjusting keys and wrenches have been removed.

16. **Avoid using an extension cord.** But if you must use one, examine the extension cord to ensure it is in good condition. Immediately replace a damaged extension cord. Always use an extension cord that uses a ground pin and connected ground wire. Use an extension cord that meets the amp rating on the motor nameplate. If the motor is dual voltage, be sure to use the amp rating for the voltage you will be using. If you use an extension cord with an undersized gauge or one that is too long, excessive heat will be generated within the circuit, increasing the chance of a fire or damage to the circuit.

17. **Keep proper footing and balance** at all times.

18. **Do not leave machine unattended.** Wait until it comes to a complete stop before leaving the area.

19. **Perform machine maintenance and care.** Follow lubrication and accessory attachment instructions in the manual.

20. **Keep machine away from open flame.** Operating machines near pilot lights or open flames creates a high risk if dust is dispersed in the area. Dust particles and an ignition source may cause an explosion. Do not operate the machine in high-risk areas, including but not limited to, those mentioned above.

21. **If at any time you are experiencing** difficulties performing the intended operation, stop using the machine! Then contact our technical support or ask a qualified expert how the operation should be performed.

22. **Habits—good and bad—are hard to break.** Develop good habits in your shop and safety will become second-nature to you.

Additional Safety Instructions for Mills

⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠CAUTION

USE this and other machinery with caution and respect. Always consider safety first, as it applies to your individual working conditions. No list of safety guidelines can be complete—every shop environment is different. Failure to follow guidelines could result in serious personal injury, damage to equipment or poor work results.

1. **Completely assemble mill before using.** Do not operate until unit is assembled and installed according to instructions.

2. **Understand all controls.** Make sure you understand the use and operation of all controls.

3. **Secure your workpiece.** Never hold a workpiece by hand for any type of machining operation. Hold your workpiece secure with a mill vise, step clamps, etc.

4. **Keep hands away from chips.** Wait until machine has come to a complete stop to clear away chips. Turn off machine and wait for cutting tool to come to a complete stop. Chips are sharp. Use a brush to clear them.

5. **Secure the cutting tool.** Make sure that the cutting tool is chucked or colleted properly. Cutting tools that are loose or not rotating correctly can come off and cause serious personal injury.

6. **Chuck key safety.** Always remove your chuck key and draw bar wrench immediately after use.

7. **Use recommended feed and speed rates.** Research the proper feed and speed rate for the material you are machining. Do not exceed these recommended rates.

8. **Cutting tool inspection.** Inspect drills and end mills for sharpness, chips or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately. Handle new cutting tools with care. Leading edges are very sharp and can cause lacerations.

9. **Keep guards in place.** Make sure cover is closed and latched before turning machine *ON*.

ELECTRICAL

220V Operation

The **SHOP FOX®** Model M1008/M1009 is prewired for 220 volt, single-phase operation. At 220V operation, the maximum amp draw from your new mill is 10 amps.

For 220V operation, we recommend using a 6-15 plug and receptacle (see **Figure 3**).

For 220V operation, only connect your machine to a circuit that is protected by a 15 amp circuit breaker.

⚠ **CAUTION:** Using a circuit breaker rated higher than 15 amps will increase the risk of fire!

Keep in mind that a circuit being used by other machines or tools at the same time will add to the total load being applied to the circuit. Add up the load ratings of all machines on the circuit. If this number exceeds the rating of the circuit breaker or fuse, use a different circuit.

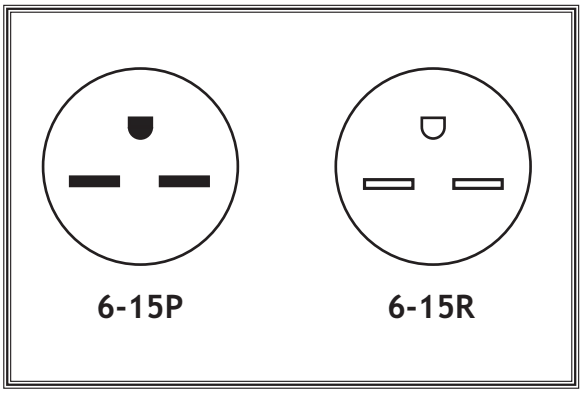


Figure 3. Typical 6-15 plug and receptacle profile for 220V operation.

110V Operation

The **SHOP FOX®** Model M1008/M1009 can be rewired for 110 volts. To do this, refer to the wiring diagram in the back of this manual. Also, you will need a NEMA-style 5-30 plug and outlet (see **Figure 4**).

At 220V operation, the maximum amp draw from your new mill is 20 amps.

For 110V operation, only connect your machine to a circuit that is protected by a 30 amp circuit breaker.

⚠ **CAUTION:** Using a circuit breaker rated higher than 30 amps will increase the risk of fire!

Keep in mind that a circuit being used by other machines or tools at the same time will add to the total load being applied to the circuit. Add up the load ratings of all machines on the circuit. If this number exceeds the rating of the circuit breaker or fuse, use a different circuit.

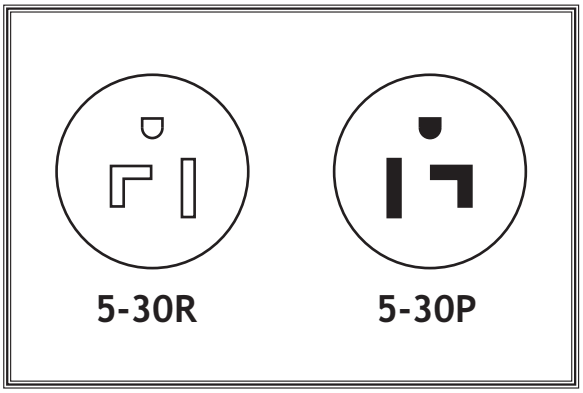


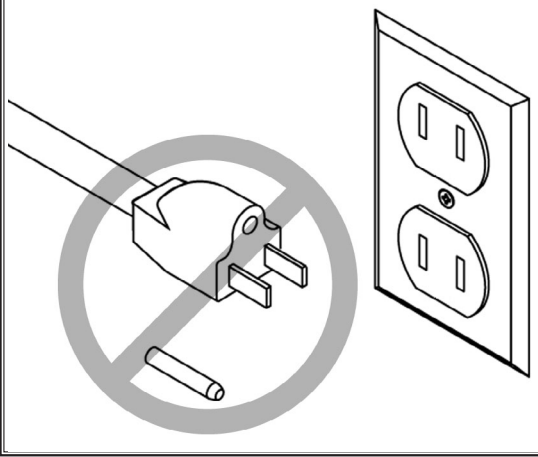
Figure 4. Typical 5-30 plug and outlet profile for 110V operation.

Grounding

This machine must be grounded! The electrical cord supplied with this machine does not come with a plug. Use a plug with a ground pin. If your outlet does not accommodate a ground pin, have it replaced by a qualified electrician or have an appropriate adapter installed and grounded properly. An adapter with a grounding wire does not guarantee machine will be grounded. A ground source must be verified.

⚠WARNING

This equipment must be grounded. Verify that any existing electrical outlet and circuit you intend to plug into is actually grounded. If it is not, it will be necessary to run a separate 12 AWG copper grounding wire from the outlet to a known ground. Under no circumstances should the grounding pin be removed from any three-pronged plug or serious injury may occur.



Extension Cords

We do not recommend using an extension cord for 220V equipment. Instead, arrange the placement of your machinery and installed wiring to eliminate the need for extension cords. If you must use an extension cord, please use the following guidelines:

- Use cords rated for Standard Service
- Only use cords 50 feet long or less
- Use cords with 12 ga. wire or bigger
- Ensure cord has a ground wire and pin
- Only use undamaged cords

SET UP

Unpacking

The **SHOP FOX®** Model M1008/M1009 has been carefully packaged for safe transporting. If you notice the machine has been damaged, please contact Woodstock International Technical Support at 1-360-734-3482 or send e-mail to: tech-support@shopfox.biz

Items Needed for Set Up

The following items are needed, but not included, to setup your machine:

- Stubby Phillips Screwdriver
- Flat Head Screwdriver
- Safety Glasses for Each Person
- Open-End Wrench 19mm
- Cleaning Solvent
- Shop Rags

⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠WARNING

USE POWER EQUIPMENT when lifting the machine from the box it was shipped in. The SHOP FOX® Model M1008/M1009 weighs 2054 lbs.

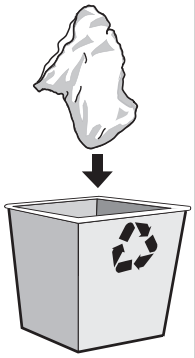
Inventory

The following is a description of the main components shipped with the **SHOP FOX®** Model M1008/M1009. Lay the components out to inventory them.

Wooden Box Contents (Figure 5)	**QTY**
A. Horizontal Arbor 1-1/4" (M1009 Only)	1
B. Horizontal Arbor 1" (M1009 Only)	1
C. Way Cover	1
D. Vertical Drawbar	1
E. Horizontal Drawbar (M1009 Only)	1
F. Wrench	1
G. Knee Handle	1
H. Vise 6" (not shown)	1

Tool Box Contents (Figure 6)	**QTY**
I. Tool Box	1
J. Drill Chuck (w/Key) 1-16mm x JT33 Taper	1
K. Handwheel Handles	3
L. Drift Key	1
M. Hex Wrench 5mm	1
N. Wrench 21/24mm	1
O. R8/MT2 Adaptor	1
P. R8/MT3 Adaptor	1
Q. R8/JT33 Drill Chuck Arbor	1
R. One Set R8 Collets	1
• 1/8"	1
• 3/16"	1
• 1/4"	1
• 5/16"	1
• 3/8"	1
• 7/16"	1
• 1/2"	1
• 9/16"	1
• 5/8"	1
• 11/16"	1
• 3/4"	1
• 13/16"	1
• 7/8"	1

If any parts are missing, find the part number in the back of this manual and contact Woodstock International, Inc. at 360-734-3482 or at techsupport@shopfox.biz



⚠WARNING

SUFFOCATION HAZARD!

Immediately discard all plastic bags and packing materials to eliminate choking/suffocation hazards for children and animals.

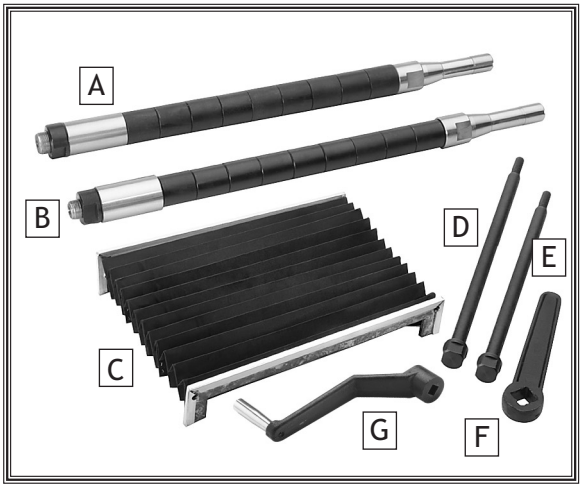


Figure 5. Wooden box contents.

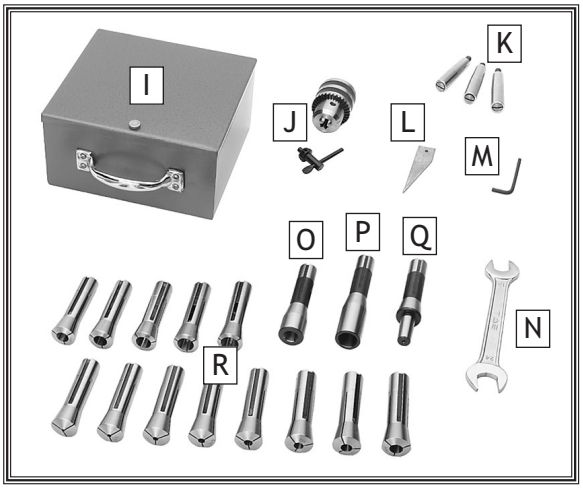


Figure 6. Tool box contents.

NOTICE

When ordering replacement parts, refer to the parts list and diagram in the back of the manual.

Machine Placement

- **Floor Load:** The Model M1008 weighs 1622 lbs. and has a 20-1/2" x 29-1/2" footprint. The Model M1009 mill weighs 2054 lbs. and has a 20-1/2" x 29-1/2" footprint. We recommend placing on concrete floors only.

- **Working Clearances:** Consider existing and anticipated needs, size of material to be processed through the machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your mill. See **Figures 7 & 8** for minimum working clearances.

- **Lighting:** Lighting should be bright enough to eliminate shadow and prevent eye strain.

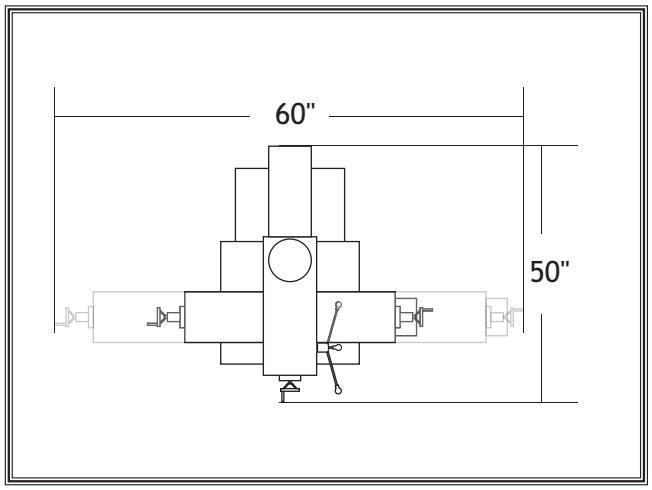


Figure 7. M1008 minimum working clearances.

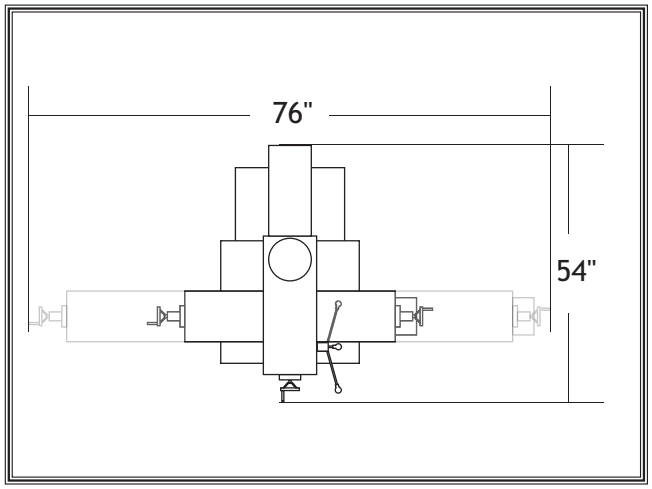


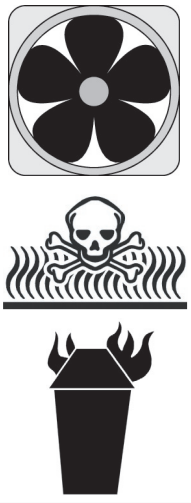
Figure 8. M1009 minimum working clearances.

Cleaning Machine

The table and other unpainted parts of your mill are coated with a waxy grease that protects them from corrosion during shipment. Clean this grease off with a solvent cleaner or citrus-based degreaser. DO NOT use chlorine-based solvents such as brake parts cleaner or acetone—if you happen to splash some onto a painted surface, you will ruin the finish.

⚠WARNING

NEVER use gasoline or other petroleum-based solvents to clean with. Most have low flash points, which make them extremely flammable. A risk of explosion and burning exists if these products are used. Serious personal injury may occur if this warning is ignored!



⚠CAUTION

ALWAYS work in well-ventilated areas far from possible ignition sources when using solvents to clean machinery. Many solvents are toxic when inhaled or ingested. Use care when disposing of waste rags and towels to be sure they DO NOT create fire or environmental hazards.

Floor Mounting

We recommend mounting your new mill to the floor with 5/16" concrete anchor studs or lag screws, depending on your floor material and future space requirements.

When mounting to your floor, you can use anchor studs (see **Figure 9**) or lag screws and lag shields (see **Figure 10**). Anchor studs are stronger and more permanent, but make moving the machine in the future more difficult. Lag bolts/shields are not as strong as anchor studs, but are much more convenient if you need to move the mill in the future.

Because of the large weight load and relatively small footprint, we do not recommend mounting this machine to wood floors.

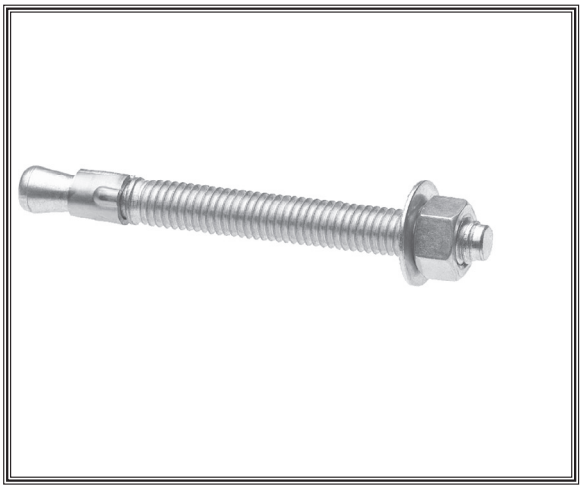


Figure 9. Anchor stud for concrete floor.

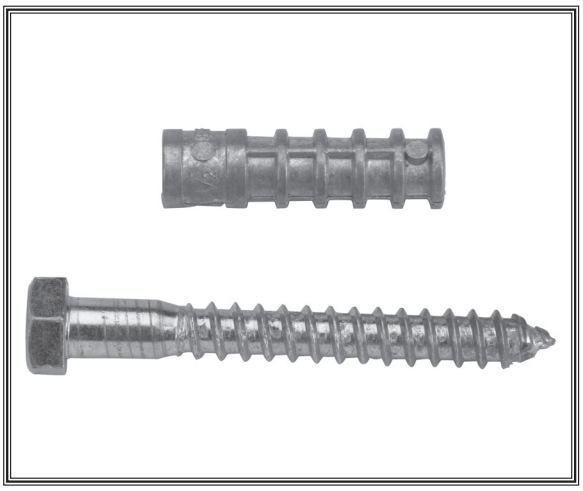


Figure 10. Lag screw and lag shield combination for concrete floor.

To mount the mill to the floor, do these steps:

1. Position the mill as close to its electrical source as possible, making sure to leave at least three feet between the back of the mill and the wall.

2. Check the mill table with a level to ensure that it is flat along its travel. If it is not, insert steel shims under the stand as necessary until the table is level.

   Note: If the slope of your floor requires you to shim more than a 3/8" or your floor is very uneven, consider pouring a level machine pad. Consult a specialist for the proper dimensions of this new pad because fastening anchors too close to the edge will crack the concrete.

3. Using the mounting holes in the mill stand as a guide, drill at least 3-1/2" deep into your floor.

4. Secure the mill to the floor with your chosen hardware.

Way Cover

The way cover protects the back part of the cross ways.

To install the way cover, do these steps:

1. Remove the four screws from the machine at the way cover mounting location (**Figure 11**).

   Note: The two screws located near the column use a nut and washer.

2. Place the way cover on the machine and align it with the fastener holes.

3. Attach the way cover with the four screws removed in **Step 1**.

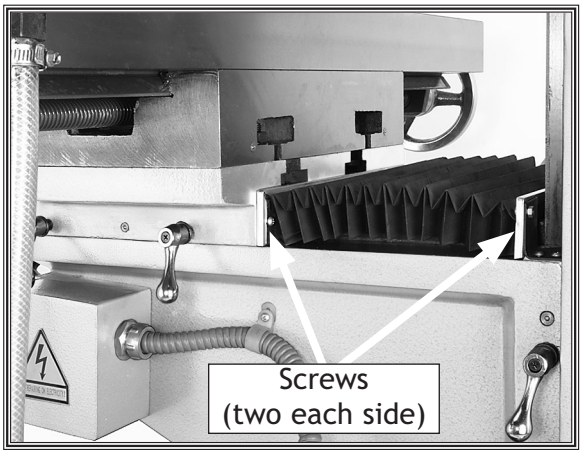


Figure **11**. Way cover mounted correctly on the machine.

Handles

Handles are provided to ease handwheel operation.

To install handles onto the handwheels, do these steps:

1. Thread handles into the face of the handwheels (see **Figure 12** for locations).

2. Tighten the handles with a flat head screwdriver

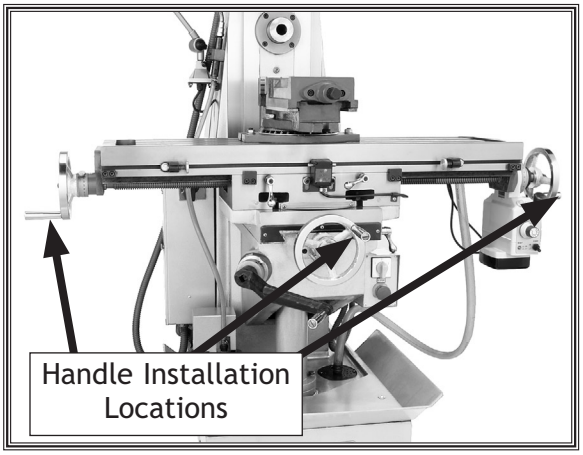


Figure 12. Locations to install handles.

OPERATIONS

General

The Model M1008/9 will perform many types of operations that are beyond the scope of this manual. Many of these operations can be dangerous or deadly if performed incorrectly.

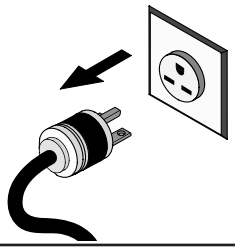
The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. **If at any time you are experiencing difficulties performing any operation, stop using this machine!**

If you are an inexperienced operator, we strongly recommend that you read books, trade articles, or seek training from an experienced milling machine operator before performing any unfamiliar operations. **Above all, your safety should come first!**

⚠WARNING

Always wear safety glasses when operating the mill. Failure to comply may result in serious personal injury.

⚠WARNING



DO NOT investigate problems or adjust the Mill while it is running. Wait until the machine is turned off, unplugged and all working parts have come to a complete stop before proceeding!

Positioning Spindle Head

The vertical spindle head can be moved forward/backward, tilted 90° both ways, and swiveled horizontally on the column.

To move the head forward/backward, do these steps:

1. Make sure the spindle is stopped and the work area is free from obstructions before proceeding.

2. Loosen the two linear lock handles that lock the travel (see **Figure 13**).

3. Place the knee travel handle on the drive nut (**Figure 13**) and rotate it either clockwise or counterclockwise until the spindle is in the desired position.

4. Remove the handle and return it to the knee travel nut.

5. Tighten the two linear lock handles.

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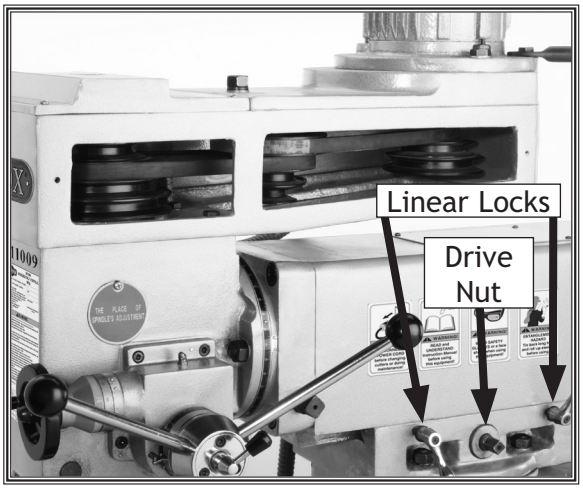


Figure 13. Location for forward/backward movement controls.

To tilt the spindle head, do these steps:

1. Make sure the spindle is stopped and the work area is free from obstructions before proceeding.

2. Loosen the three nuts that lock the spindle in place (see **Figures 14 & 15**).

3. Remove the lock pin from its position by pulling it out.

4. Rotate the drive nut (**Figure 15**) either clockwise or counterclockwise until the spindle is tilted to the desired angle, as displayed on the graduated scale.

5. Tighten the three nuts to lock the spindle in place, and push in the lock pin as far as it will go.

Note: For accurate positioning, additional setup tools should be used to determine the precise angle of the spindle head.

To swivel the spindle head horizontally, do these steps:

1. Make sure the spindle is stopped and the work area is free from obstructions before proceeding.

2. Using a wrench, loosen the four nuts at the top of the mill base (**Figure 15**).

3. Push or pull the spindle head/overarm to swivel it to the desired position. At the base, there is a graduated scale for positioning.

4. Tighten the four nuts to lock the spindle in position.

Note: This positioning method will generally be done when switching between horizontal and vertical operations.

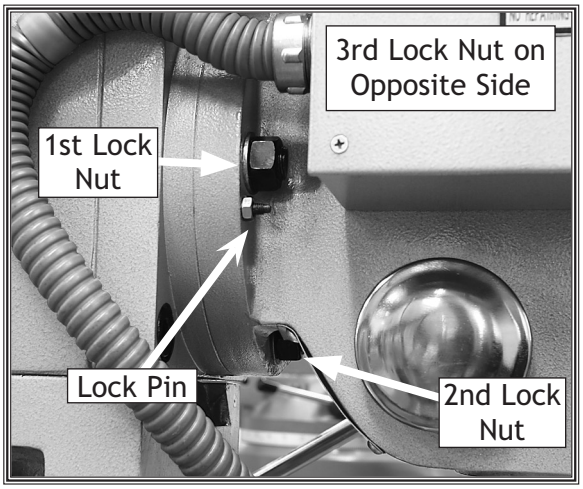


Figure 14. Controls for tilting spindle head.

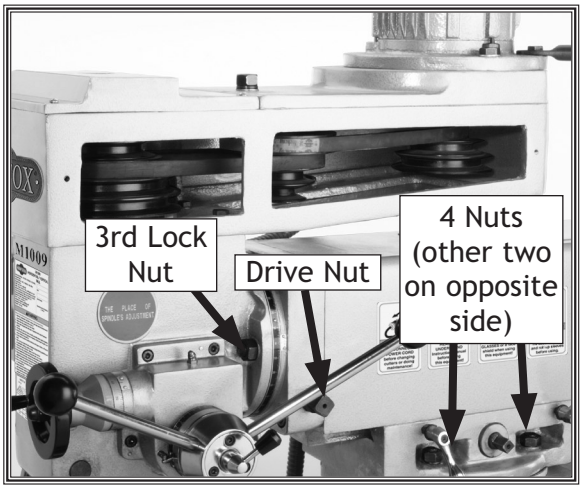


Figure 15. Controls for tilting and swiveling spindle head.

M1009 Vertical/ Horizontal Conversion

To convert the Model M1009 from vertical spindle operation to horizontal, do these steps:

1. **UNPLUG THE MACHINE!**

2. Loosen the three nuts that lock the spindle in place (see **Figures 14 & 15**).

3. Remove the lock pin from its position by pulling it out.

4. Rotate the drive nut (**Figure 15**) either clockwise or counterclockwise until the spindle head is tilted 90˚.

5. Using a wrench, loosen the four nuts at the top of the mill base (**Figure 15**).

6. Push or pull the overarm to swivel it 180˚, so that the spindle support is in-line with the horizontal spindle axis.

7. Insert a horizontal arbor into the spindle support and swivel the overarm until the horizontal arbor will fit into the horizontal spindle, as shown in **Figure 16**.

8. Tighten the four nuts to lock the overarm in position.

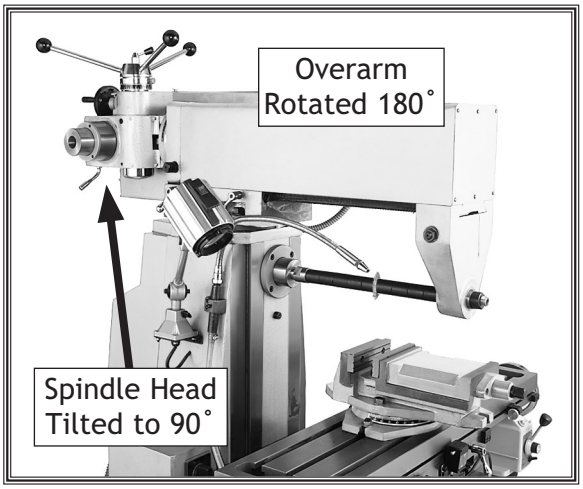


Figure 16. M1009 converted for horizontal spindle use.

Table Travel

The table of the Model M1008/M1009 can be moved in 3 axes. Each of these axes are handwheel controlled, and all handwheels are graduated to accurately position of the workpiece in relation to the tool (see **Figure 17** for locations).

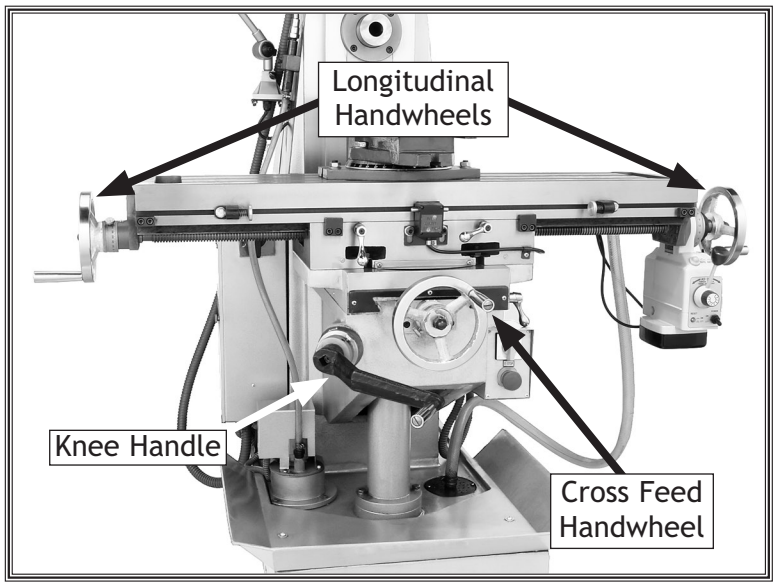


Figure 17. Table travel handwheel locations.

Cross Feed

The cross feed is controlled by the center handwheel and can be locked in position by the two locks on the right side of the mill, under the table (see **Figure 18**).

Longitudinal Feed Control

The longitudinal feed is controlled by two handwheels, one at each end of the table, and can be locked in position by the two locks at the front of the table (see **Figure 19**).

Knee Feed

The knee feed is controlled by one handle, just off center at the front of the machine, and the two knee travel locks on the right side of machine where the knee meets the ways (see **Figure 20**).

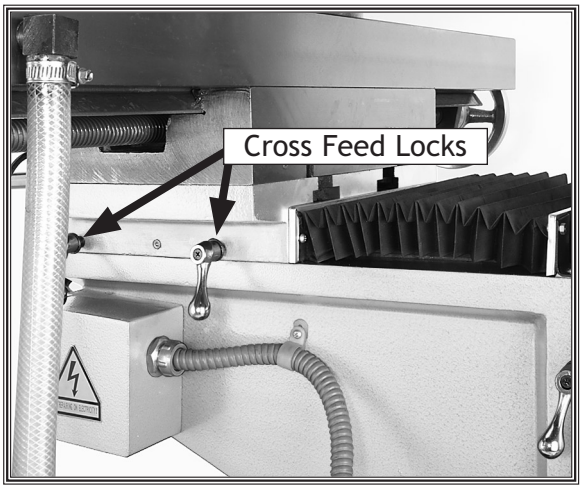


Figure 18. Cross feed lock locations.

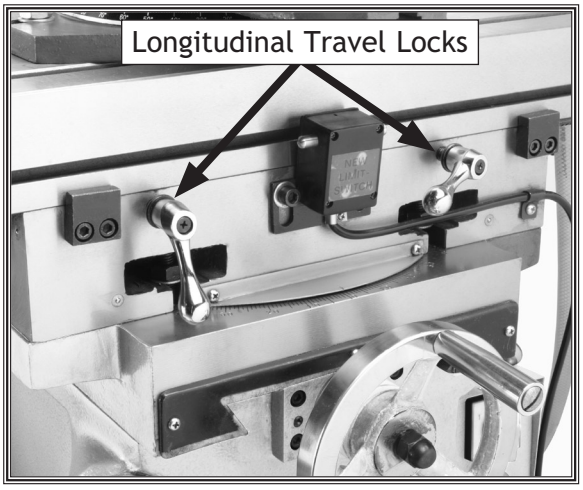


Figure 19. Longitudinal feed lock locations.

Figure 20. Knee feed lock locations.

Rotating Table

The mill table can be rotated 45º in either direction for positioning the workpiece.

To rotate the mill table, do these steps:

1. Make sure the power is turned *OFF*.
2. Remove as many items from the mill table as possible. This will make rotating the table easier.
3. Loosen the four table nuts, two in front and two in back, to free the table for rotation (see **Figures 21 & 22**).
4. Rotate the table to the desired position. There is a graduated scale for accurate positioning.
5. Tighten the four nuts to secure table in position.

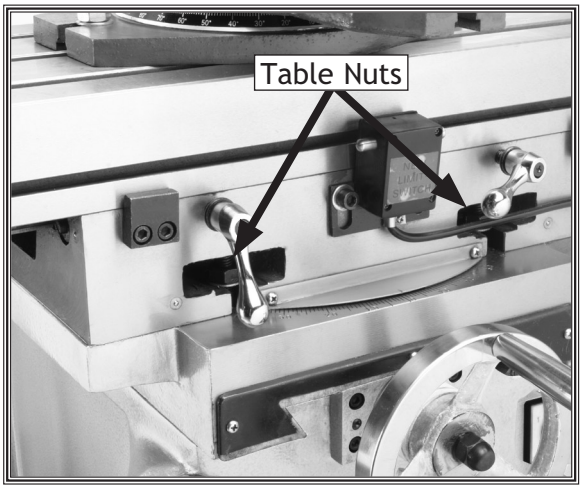


Figure 21. Front two table nuts.

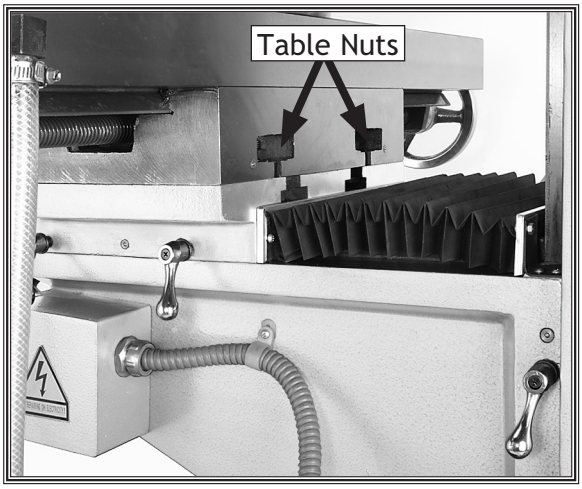


Figure 22. Rear table nuts.

Rotating Vise

The Model M1008/M1009 comes equipped with a milling vise. The vise has a swivel base that allows it to rotate 360º.

To rotate the vise, do these steps:

1. Make sure the power is turned *OFF*.
2. Loosen the vise nuts (see **Figure 23**), one on each side, to free up the vise.
3. Rotate the vise to the desired position. The swivel base has graduations for more accurate positioning.
4. Tighten the two nuts to lock the vise in place.

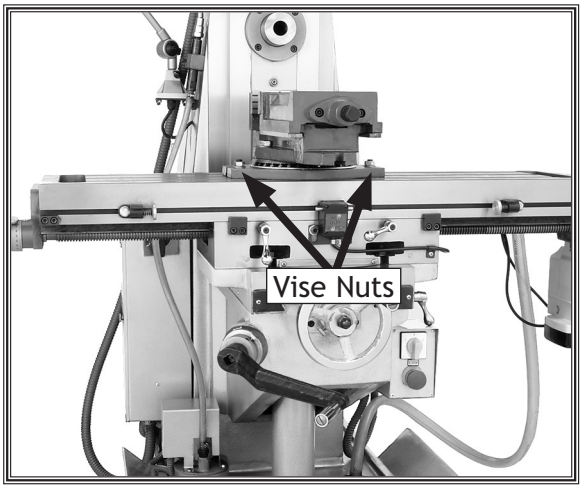


Figure 23. Vise nuts.

Quill Travel

Quill Feed Control

The quill feed is controlled by the quill feed handle and quill lock shown in **Figures 24 & 25**. The handle allows the mill to operate as a drill. Pull the handle towards you and the quill will feed down towards the workpiece. The quill feed handle is spring loaded so that it will automatically return to its upmost vertical position.

NOTICE: When returning the quill to its upmost position, keep your hand on the quill feed handle so it does not spring up and slam the quill against the head.

Micro-Feed Adjustment

The spindle position can be accurately controlled through the use of the micro-feed handwheel (see **Figure 25**). **To use this feature, you must first lock the quill feed handle lock (Figure 24) by turning it all the way in.** Once the quill feed handle is locked, verify that the micro-feed handwheel turns, then position the cutting tool using the graduated dial.

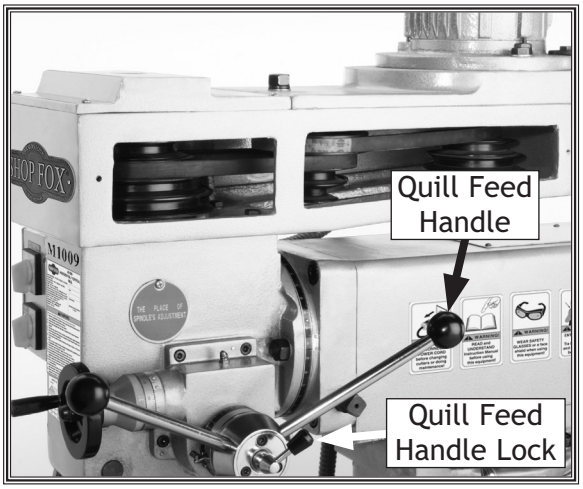


Figure 24. Quill feed handles.

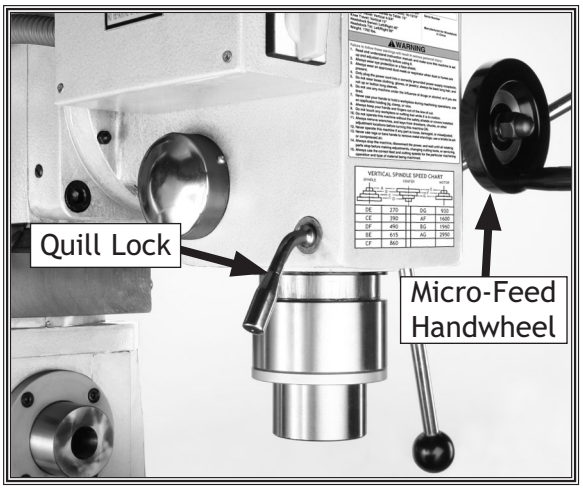


Figure 25. Quill lock and micro-feed handles.

Power Feed Controls

The Model M1008/M1009 comes equipped with a power feed option on the longitudinal travel. The power feed has the following options (see **Figure 26** for items A–D, and see **Figure 27** for items E–G):

A. Right/Left Feed Selector—Switch the lever to the left or the right for the desired travel direction. The table should come to a complete stop before changing directions.

B. Rapid Speed Switch—Pressing this switch will cause the table to feed at its maximum rate until it is released.

C. Feed Setting Dial—Setting from 0 (no travel) to 10 (fastest travel). There is no correlation between the numerical setting on the dial and actual feed in inches per minute (IPM).

D. ON/OFF Switch—Starts/stops the power feed. (The power feed should be left off when not in use.)

E. Limit Switch—Stops the power feed when it makes contact with the adjustable power feed stops.

F. Power Feed Stops—Adjustable stops trigger the limit switch when the power feed is at the end of its travel.

G. Table Hard Stop—Mechanically limits the longitudinal travel. N remove the stops unless servicing the mill.

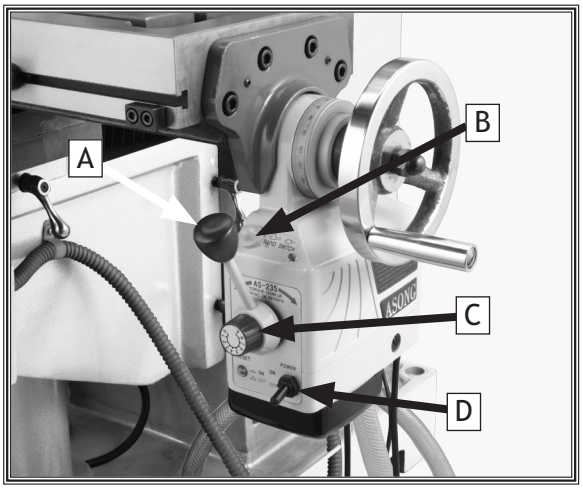


Figure 26. Power feed controls.

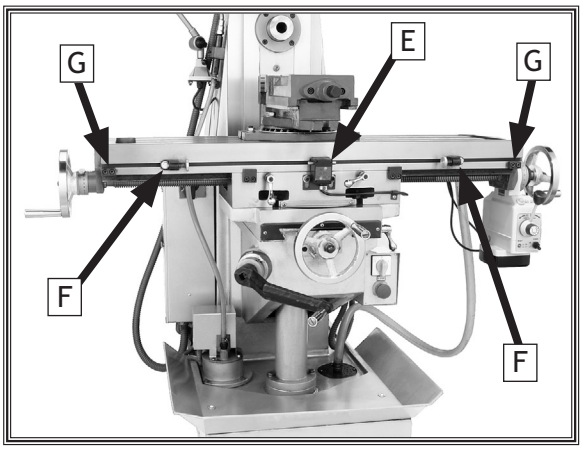


Figure 27. Power feed and table stops.

Determining Needed RPM

Before changing speeds, you must first determine the best RPM to use with the material and diameter of your cutting tool. Using this determined RPM, you can then reference the spindle speed chart on the mill and set the V-belts to match that speed.

To determine the RPM needed for your workpiece, do these steps:

1. Use the chart in **Figure 28** to determine the cutting speed for your workpiece material.

2. Measure the diameter of your cutting tool in inches.

3. Use the following formula in **Figure 29** to determine the needed RPM for your operation. **Note:** Always round to the closest RPM given on the spindle speed chart.

Example 1

You have a piece of aluminum stock, and you are using a 1/2" diameter HSS cutting tool.

Step 1:
300 (SFM from chart) x 4 = 1200

Step 2:
1200 / .5" (Diameter of cutting tool) = 2400 RPM

Result:
The needed speed for this workpiece is 2400 RPM.

Example 2:

You have a piece of stainless steel, and you are using a 1" diameter carbide cutting tool.

Step 1:
60 (SFM from chart) x 2 (for carbide tool) = 120

Step 2:
120 (determined SFM) x 4 = 480

Step 3:
480 / 1" (Diameter of cutting tool) = 480 RPM

Result:
The needed speed for this workpiece is 480 RPM.

Cutting Speeds for High Speed Steel (HSS) Cutting Tools*	
Workpiece Material	**Cutting Speed (SFM)**
Aluminum & Alloys	300
Brass & Bronze	150
Copper	100
Cast Iron, soft	80
Cast Iron, hard	50
Mild Steel	90
Cast Steel	80
Alloy Steel, hard	40
Tool Steel	50
Stainless Steel	60
Titanium	50
Plastics	300-800
Wood	300-500
*For carbide cutting tools, double the cutting speed. These values are a guideline only. Refer to the current edition of *MACHINERY'S HANDBOOK* for more detailed information.	

Figure 28. Cutting speed chart for HSS cutting tools.

$$\frac{\text{Cutting Speed (SFM)} \times 4}{\text{Tool Diameter (in inches)}} = \text{RPM}$$

Figure 29. Formula to determine required RPM.

OPERATIONS

Setting RPM

Setting the RPM involves placing the V-belts on the pulleys as shown in the spindle speed chart on the machine.

Model M1009 Note: This model has separate spindle speed charts for both the vertical and horizontal spindles; otherwise, the instructions for changing the V-belts only differ where specified below.

To set the spindle speed, do these steps:

1. Examine the **Spindle Speed Chart** near the spindle on your machine to find the closest match to your needed RPM (see **Figure 30** for M1008/M1009 vertical spindle or see **Figure 31** for M1009 horizontal spindle).

2. **UNPLUG THE MILL!**

3. Remove/open the access panel to the spindle pulleys.

4. *For Vertical Spindle (Model M1008/M1009):* Loosen the pulleys shown in **Figure 30**, and move the motor and center pulley to loosen the V-belts.

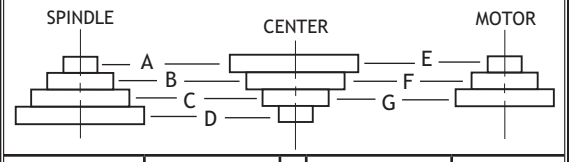
   For Horizontal Spindle (M1009 only): Loosen the pulleys shown in **Figure 31**, and move the center pulley to loosen the V-belts.

5. Move the belts to the appropriate pulley combination as shown on the spindle speed chart.

6. Tension the V-belts by reversing **Step 4**.

7. Close/replace the access panel to the spindle pulleys.

VERTICAL SPINDLE SPEED CHART



DE	270		DG	930
CE	390		AF	1800
DF	550		BG	1960
BE	615		AG	2950
CF	860			

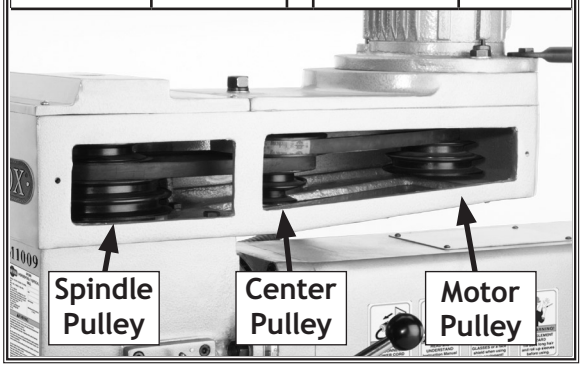
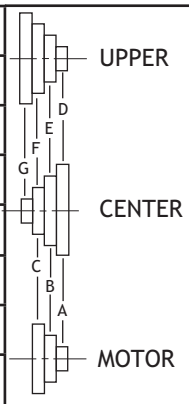


Figure 30. Vertical spindle speed chart and pulley locations.

HORIZONTAL SPINDLE SPEED CHART

1	AG	72
2	BG	170
3	CG	210
4	AF	240
5	AE	290
6	BF	550
7	CE	830
8	BD	1300



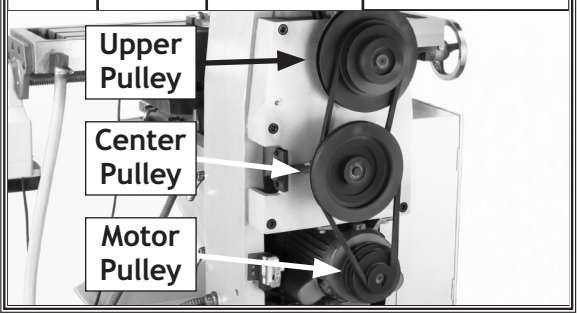


Figure 31. Horizontal spindle speed chart and pulley locations (Model M1009 only).

Spindle Controls

The spindle switch allows you control which direction the spindle rotates, depending on your cutting tool direction of cut. **Note:** The spindle switch will only work when the main power is turned *ON*.

- **Figure 32** shows the location of the vertical spindle switch for both Model M1008/M1009.
- **Figure 33** shows the location of the horizontal spindle switch for the Model M1009.

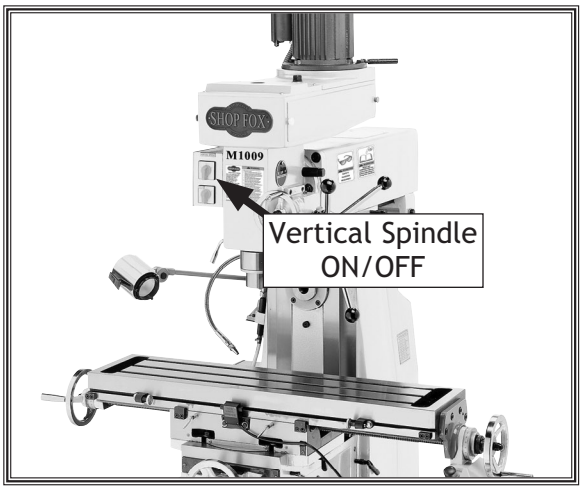


Figure 32. Vertical spindle control for Model M1008/M1009.

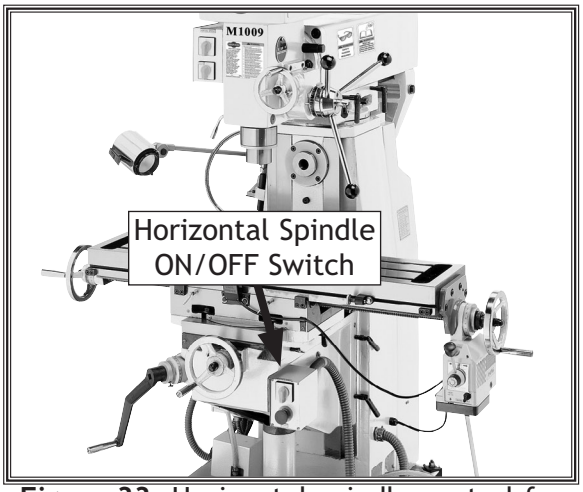


Figure 33. Horizontal spindle control for Model M1009.

Start Up and Spindle Break-in Procedures

Complete this process once you have familiarized yourself with all instructions in this manual and have made sure the machine is completely lubricated. **Note:** These instructions must be followed for both the horizontal and vertical spindles.

NOTICE

The spindle break-in procedures are important for ensuring long life and trouble-free performance from your mill. Failure to perform these may lead to shortened life of your machine.

To begin the start up procedure, do these steps:

1. Make sure there are no obstructions around or underneath the spindle.
2. Turn the spindle ON/OFF switch to either the FORWARD or REVERSE and verify that the spindle rotates in the proper direction.

To break-in the spindle, do these steps:

1. Make sure the mill has been properly lubricated.
2. Make sure the spindle area is free from obstructions.
3. Set the spindle speed to the **lowest** RPM.
4. Turn on the spindle and let it run for a minimum of 10 minutes.
5. Repeat these steps for each RPM setting.

Installing Tools

To load a tool in the vertical spindle, do these steps:

1. **UNPLUG THE MILL!**
2. Clean any debris from the spindle opening.
3. Insert the tool holder or a collet into the spindle.
4. Rotate the holder until the groove lines up with the key and the holder slides into the spindle.
5. Using a wrench, tighten the drawbar (see **Figure 34**) until the tool is secure in the spindle.
6. Clear all items away from the cutting tool before turning the spindle *ON*.

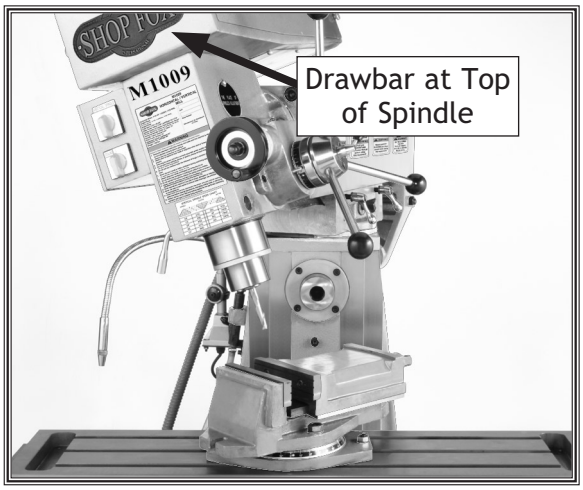


Figure 34. Vertical spindle with tool loaded.

To load a tool in the horizontal spindle, do these steps:

1. **UNPLUG THE MILL!**
2. Clean any debris from the spindle opening.
3. Rotate the vertical spindle 90°, as shown in **Figure 35**.
4. Rotate the overarm 180° so that the spindle support is in-line with the horizontal spindle axis, as shown in **Figure 35**.
5. Prepare the arbor by installing the cutting tool between the spacers.
6. Insert the arbor, with the cutting tool already loaded into the spindle (see **Figure 36**).
7. Rotate the arbor until the groove lines up with the key and the holder slides into the spindle.
8. Using a wrench, tighten the drawbar until the tool is secure in the spindle.
9. Adjust the spindle support distance to provide proper support during the cutting operation.
10. Tighten the arbor nut to keep the cutting tool and arbor secure.
11. Clear all items away from the cutting tool before turning the spindle *ON*. **Note:** Remove the drawbar from the horizontal spindle when not in use.

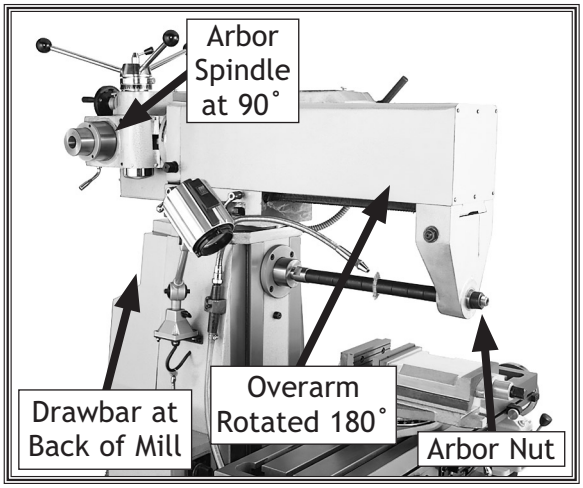


Figure 35. Horizontal spindle with arbor loaded.

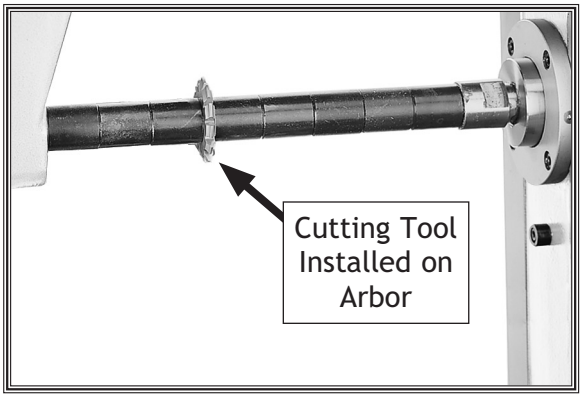


Figure 36. Cutting tool installed on arbor, between spacers.

Removing Tools

To remove cutting tools, do these steps:

1. **UNPLUG THE MILL!**
2. Remove any debris or chips from the tool and the tool holder/arbor.
3. Lock the spindle in place to keep it from rotating. (If you are removing tools from a vertical spindle, be sure to return the vertical quill to its upmost position first.)
4. Place one hand on the tool holder for support and use a wrench to loosen the tool holder on the drawbar.
5. Once the tool is loosened, you may need to strike the drawbar with a dead blow or rubber mallet to release the tool holder from the spindle.
6. Finish unscrewing the drawbar by hand.
7. Clean any debris from the spindle opening area.
8. Return the spindle(s) to the appropriate operating position for the next cut.

Coolant System

The Model M1008/M1009 is equipped with a coolant system (see **Figure 37**), which should be filled prior to starting the pump to avoid cavitation.

NOTICE

Running the pump without coolant in the system will damage the cooling system. This neglect will not be covered by the warranty.

To turn the coolant system *ON*, do these steps:

1. Adjust the flexible nozzle to the general area that you want coolant applied.
2. Turn the coolant switch *ON*.
3. Adjust the nozzle as needed.

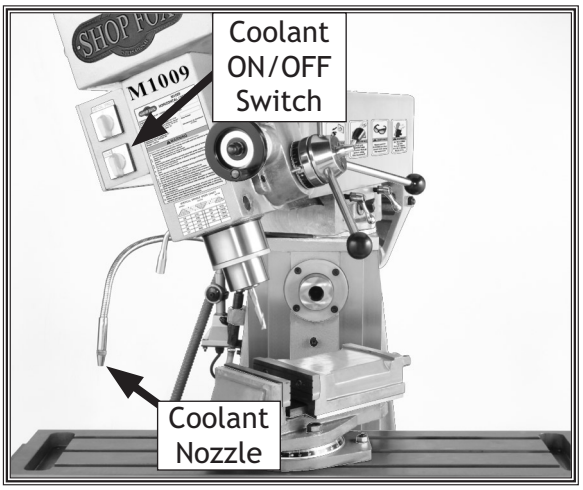


Figure 37. Coolant controls.

MAINTENANCE

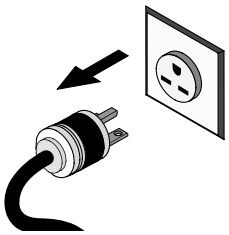
General

Regular periodic maintenance on your **SHOP FOX®** mill will ensure optimum performance. Make a habit of inspecting your mill each time you use it.

A thorough cleaning, on a regular basis, will increase the machine durability and efficiency by removing chips and grime that can gum up moving parts.

A regular application of a protective spray coating will keep the table and other bare metal parts from rusting and pitting.

⚠WARNING



MAKE SURE that your machine is unplugged during all maintenance procedures! If this warning is ignored, serious personal injury may occur.

Cleaning

Cleaning the Model M1008/M1009 is relatively easy. Vacuum excess metal chips from the table and ways, and wipe off the remaining waste with a dry cloth. If any coolant is left on the table, wipe it up with a rag. Treat all unpainted cast iron and steel with a non-staining lubricant after cleaning.

Table and Base

Protect the unpainted cast iron surfaces by wiping them clean after every use—this ensures moisture does not remain on bare metal surfaces.

Keep exposed cast iron rust-free with regular applications of surface lubricants designed for cast iron.

Remove vices, clamps, rotary tables, etc. after use so moisture cannot be trapped between the components and cause rust.

Checking/Adding Coolant

A small amount of coolant is lost during normal machining operations.

To check/add coolant, do these steps:

1. Remove the drain screen (**Figure 38**), and inspect how far the coolant is from the top of the tank.

    - If the coolant is more than 2" from the top of the tank, add more coolant to fill the tank.

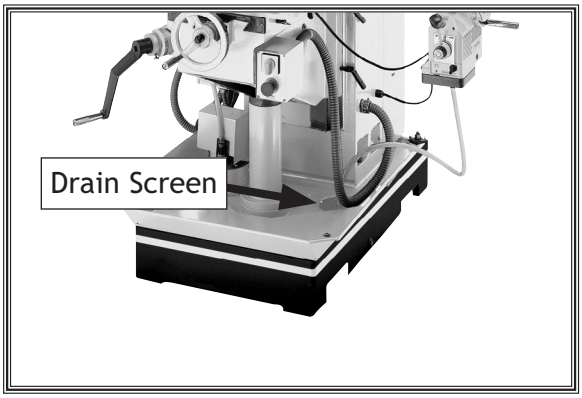


Figure 38. Location of drain screen.

Lubrication

Power Feed

The power feed uses SAE 40 oil and should not need to be changed unless the unit is being repaired.

Ball Fittings

Ball fittings are responsible for the majority of the machine lubrication. To lubricate ball fittings, depress the ball with the tip of an oil can nozzle and squirt a little oil inside the fitting. Make sure to clean the outside of the ball fitting before and after each use to keep out contaminants.

For ball fitting lubrication points, use ISO 68 or SAE 20W non-detergent oil or similar lubricant.

Lubricate the following areas every 8 hours of actual use:

Back of Machine (Model M1009 only; see Figure 39):

A. Horizontal Arbor Support Bearing
B. Horizontal Spindle Pulleys (Must open back access cover to do this).

Left Side of Machine (Figures 40-42):

C. Column/Knee Intersection
D. Longitudinal Feed Handwheel
E. Longitudinal Ways (under table)
F. Cross Ways (under table)
G. Table Rotation (front and back)
H. Knee Feed Handwheel

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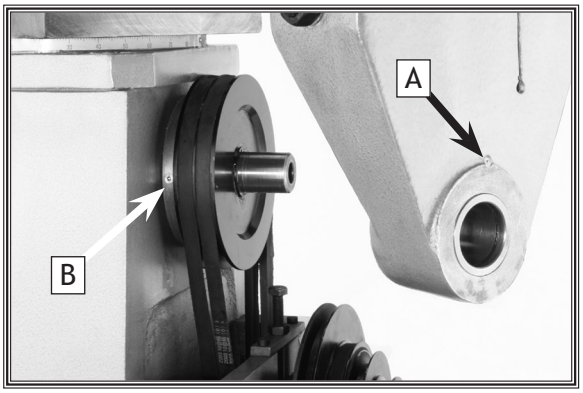


Figure 39. Back of machine fittings.

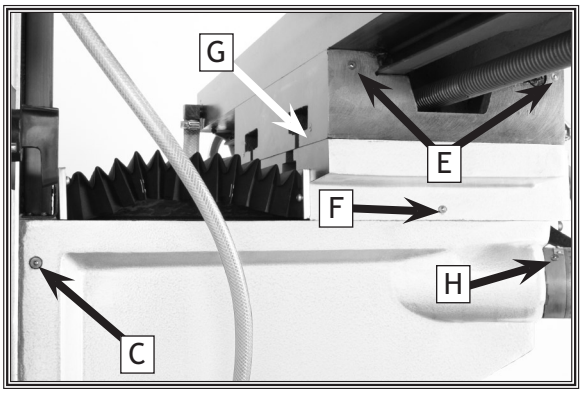


Figure 40. Left side of mill, under table.

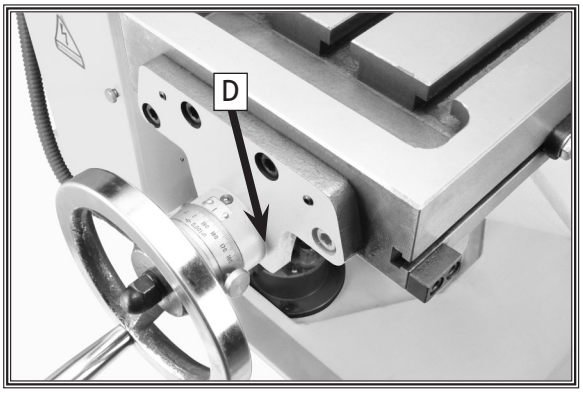


Figure 41. Longitudinal handwheel.

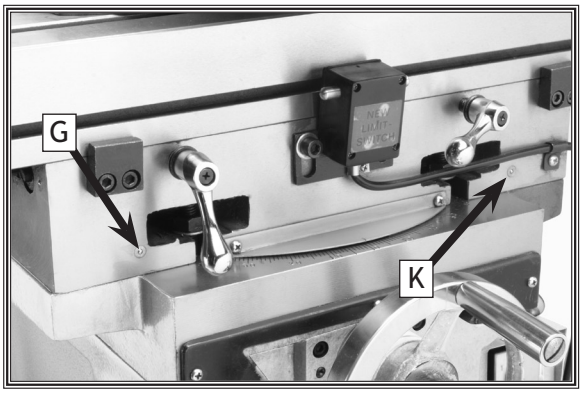


Figure 42. Front of mill.

MAINTENANCE

Right Side of Machine (Figures 43, 44, & 45):
I. Column/Knee Intersection
J. Cross Ways (Under Table)
K. Table rotation (Front and Back)
L. Quill Feed
M. Horizontal Spindle (Model M1009)

Changing Coolant

The Model M1008/M1009 coolant tank holds approximately 4 gallons of coolant. We recommend changing this fluid every six months or sooner if it develops an unpleasant odor.

For the best protection against rust, coolant ratios should be approximately 5 parts water to 1 part concentrated cutting fluid for light-duty machining; or 3 parts water to 1 part concentrated cutting fluid for heavy-duty machining.

To change the cutting coolant, do these steps:

1. Place an oil pan under the drain plug (**Figure 46**), remove the drain plug, and allow the coolant to drain completely.

2. Remove the drain screen and use the opening to clean out any sludge. A magnet will help remove metal particles.

3. Replace the drain plug.

4. Fill the tank with a new mixture of coolant by pouring into the tank opening where the drain screen was removed.

5. Replace the drain screen you removed in **Step 2**.

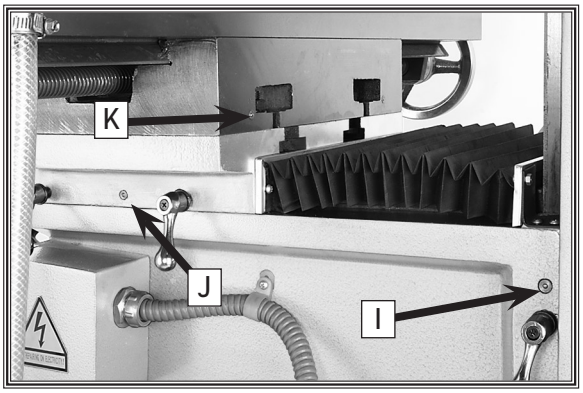


Figure 43. Right side of mill, under table.

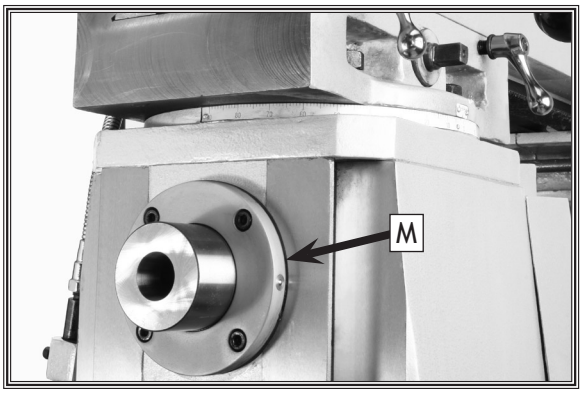


Figure 44. Model M1009 horizontal spindle.

Figure 45. Quill handwheel.

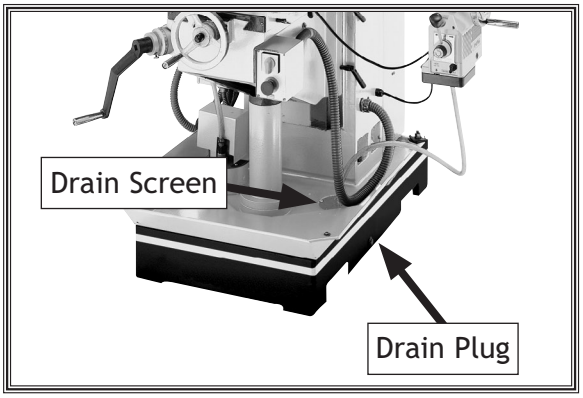


Figure 46. Location of drain screen and plug.

Maintenance Schedule

Daily:
- Safety Shutoffs
- Check V-belt tension.
- Clean machine to remove debris.
- Make sure table/vise is clean and free of metal chips.
- Clean spindle openings before inserting tools.
- Check for any unsafe conditions.
- Check/add coolant.

Weekly:
- Thoroughly clean the machine ways to remove chips and debris.
- Clean/grease the longitudinal, cross, and knee lead screws.

Monthly:
- Check oil level in gear box and power feed; fill if needed.
- Clean/vacuum dust buildup from the inside cabinets and from the motor(s).

Every six Months:
- Clean out coolant tank and replace coolant.

Maintenance Notes

DATE	MAINTENANCE PERFORMED

SERVICE

General

This section covers the most common service adjustments or procedures that may need to be made during the life of your machine. **Always disconnect your machine from the power source before performing any service!**

If you have additional service questions, please contact Woodstock International Technical Support at (360) 734-3482 or send e-mail to: **tech-support@shopfox.biz**.

Gibs

Each sliding dovetail on the Model M1008/M1009 has a gib that is sandwiched between two adjustment screws (see **Figures 47-49** for the locations of one end of each adjustment screw). Some minor components must be removed to access all the gib adjustment screws. Adjust the gibs by loosening one screw and tightening the other at the opposite end until a slight drag is felt while moving the table/spindle along the dovetail slides; then tighten the loose screw at the other end to lock the setting in place. **Note:** The M1009 spindle support adjusts along the dovetail slide by a clamping system (see **Figure 50**).

NOTICE

When adjusting gibs, the goal of gib adjustment is to remove unnecessary sloppiness without causing the slides to bind. Loose gibs may cause poor finishes on the workpiece and may cause undue wear on the slide. Over-tightening may cause premature wear.

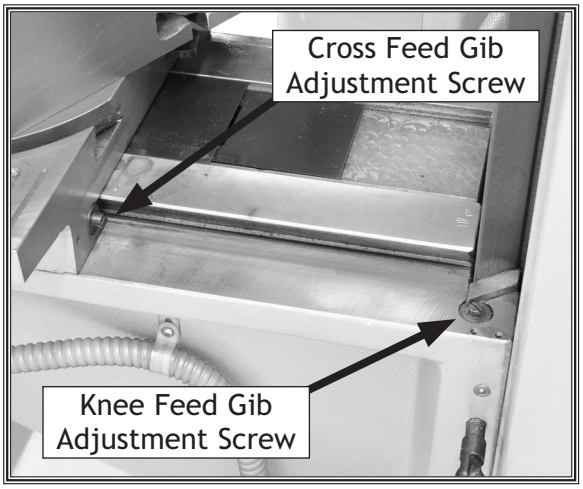


Figure 48. Location of one end of cross feed & knee feed gib adjustment screws.

Figure 49. Location of end of spindle head gib adjustment screw.

Figure 47. Location of one end of longitudinal gib adjustment screw.

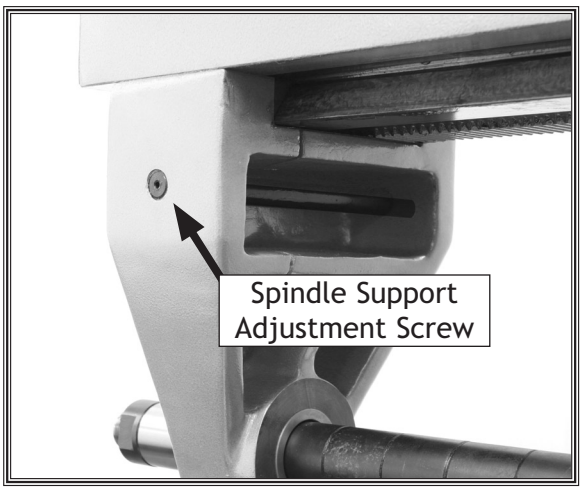


Figure 50. Location of adjustment screw for spindle support dovetail clamp.

Belt Replacement

When a V-belt is worn, cracked, or broken, it needs to be replaced. The following instructions are for belt replacement.

To replace vertical spindle belts (Model M1008/M1009), do these steps:

1. **UNPLUG THE MILL!**
2. Loosen the motor nut and center pulley nut.
3. Pull the motor towards front of the mill.
4. Remove the four Phillips head screws on the top cover (See **Figure 51**), and remove the cover.
5. Open the access panel to the V-belts.
6. Remove the front V-belt by moving the belt down the center pulley set and then up the front pulley set.
7. Remove the rear V-belt by moving the belt down both pulley sets.
8. Replace the rear V-belt first, by placing the belt under both pulley sets and then working up.
9. Replace the front V-belt by dropping the belt over the front pulley set, through the opening in the top, and under the center pulley set.
10. Move the V-belts to the desired RPM setting and tighten the nuts. Review **Setting RPM** on **Page 25** for detailed instructions.
11. Replace the access cover and secure in place with the two thumb screws.
12. Replace the top cover and secure in place with the four Phillips head screws.

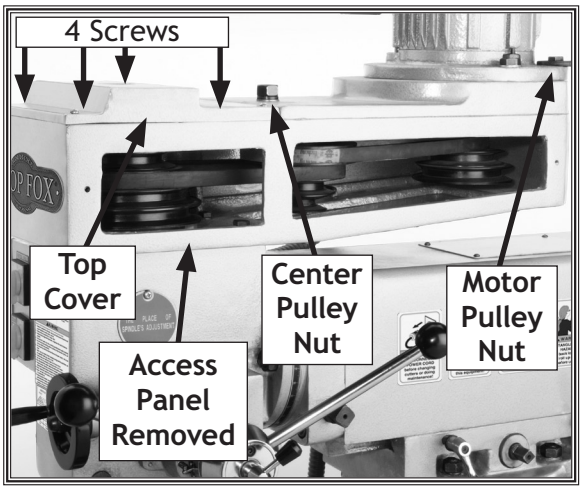


Figure 51. Vertical spindle pulley access for belt replacement.

SERVICE

To replace the horizontal spindle V-belts (Model M1009 only), do these steps:

1. **UNPLUG THE MILL!**
2. Open the horizontal spindle pulley access panel.
3. Loosen the bolt that holds the center pulley set in place (see **Figure 52**). **Note:** The bolt can be accessed through the opening next to the tension nut.
4. Remove the tension nut between the motor and the middle pulley sets to release tension on the V-belts.
5. Slide the center pulley set to the right to release tension and allow the belts to move.
6. Remove and replace the damaged V-belt.

   Note: The upper V-belt must be installed first.
7. Move the V-belts to the appropriate pulley sets for the needed RPM.
8. Move the center pulley set back into position and reinstall the tension nut, bringing the pulleys to the proper tension.
9. Tighten the nut to secure the center pulley set.
10. Close the access cover.

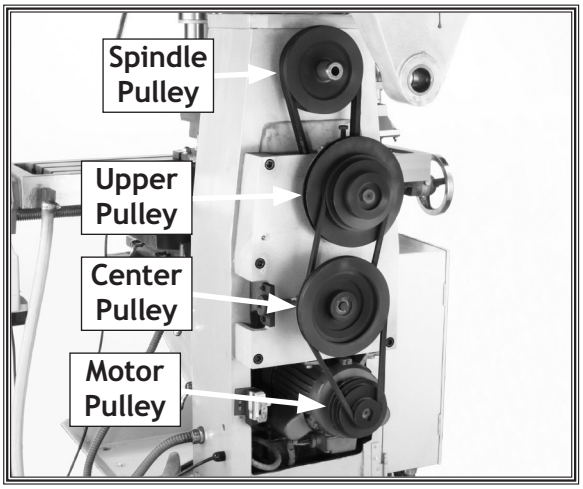
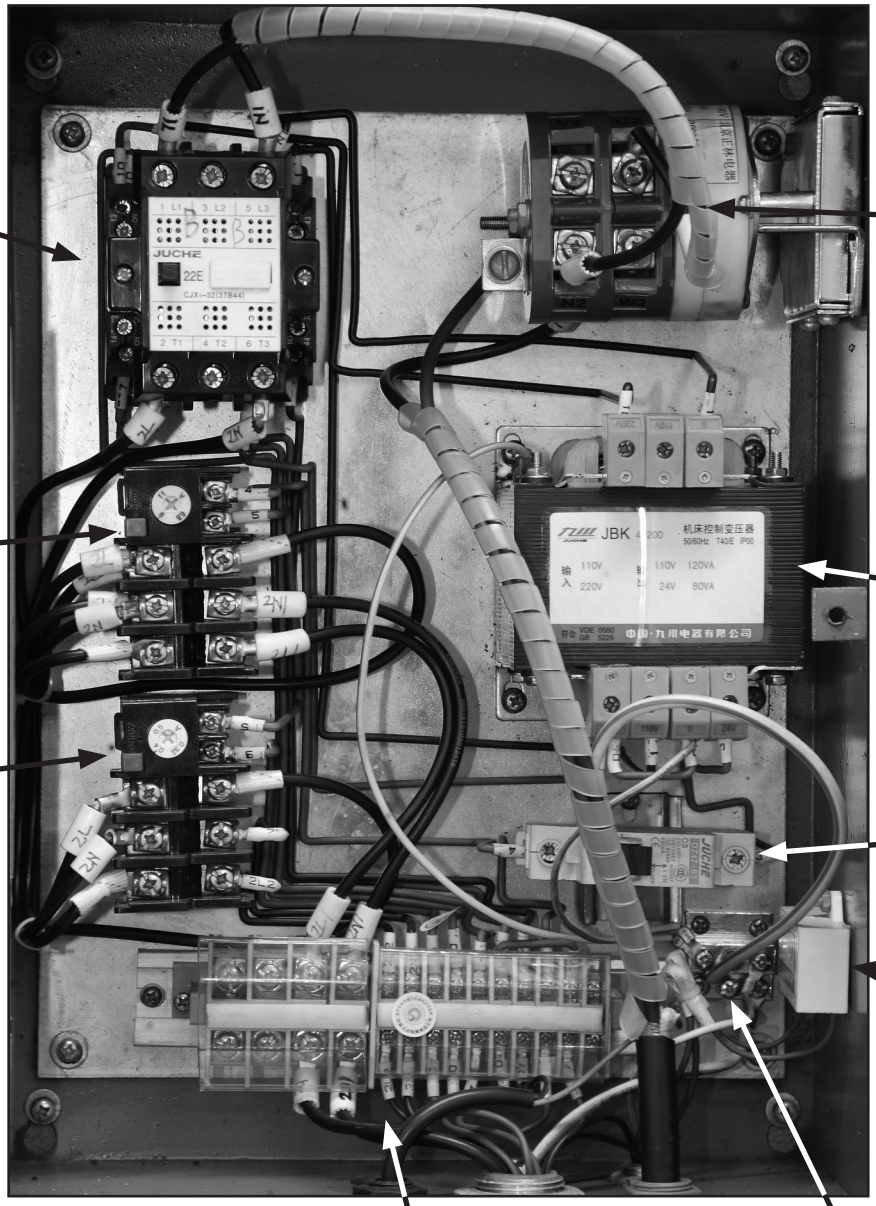


Figure 52. Horizontal spindle pulley cover removed for belt replacement.

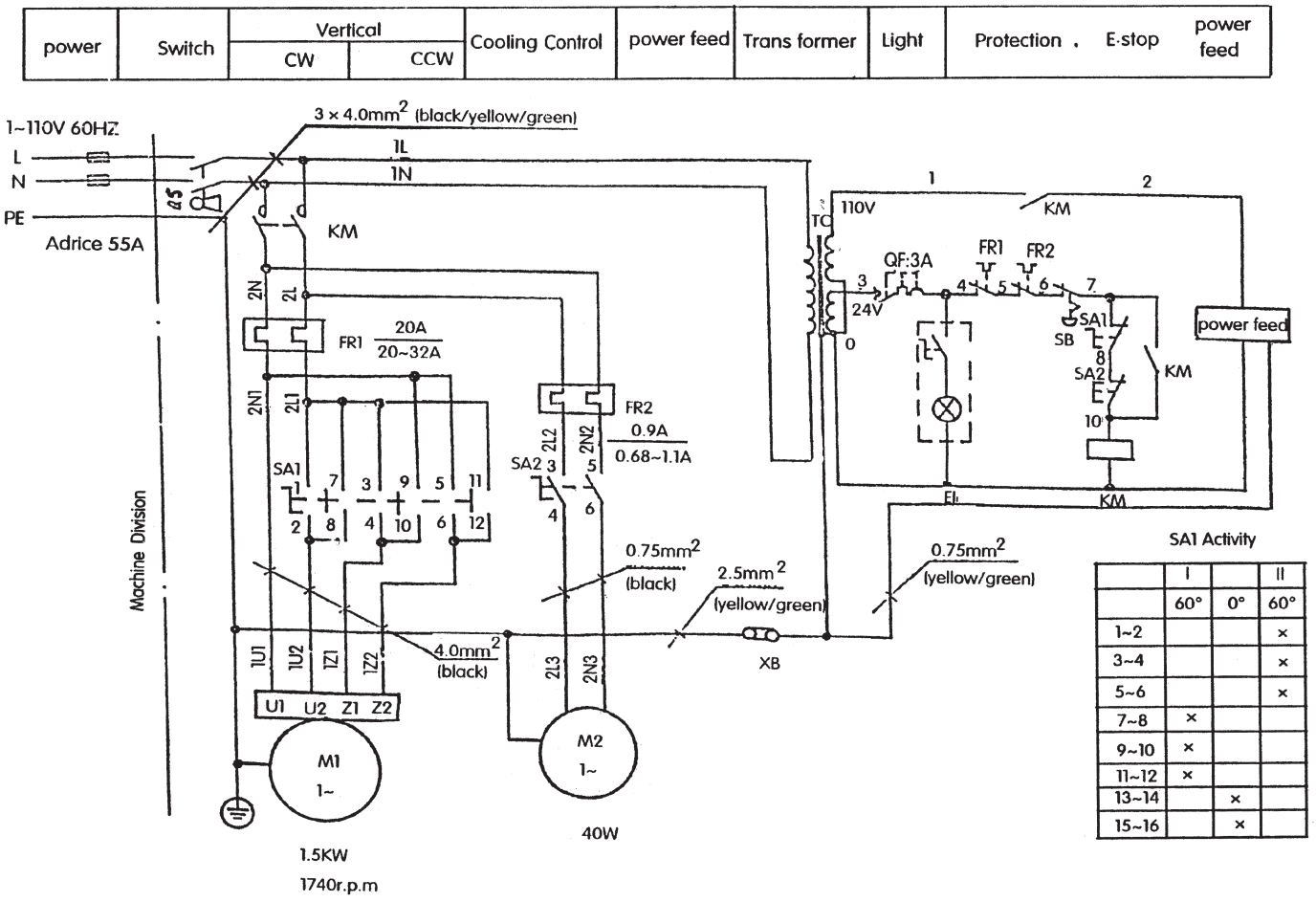
To replace the V-belt mounted directly on the horizontal spindle (Model M1009 only), do these steps:

1. **UNPLUG THE MILL!**
2. Complete **Steps 1–4** from the instructions above.
3. Loosen the spindle tension bolt. Do not loosen the nut (see **Figure 52**).
4. Pull the upper pulley set up to loosen tension on the spindle pulleys.
5. Remove the damaged V-belt and replace it.
6. Tighten spindle tension bolt.
7. Push the upper pulley set back into position.
8. Complete **Steps 7–9** from the instructions above.

M1008 Wiring Box Identification



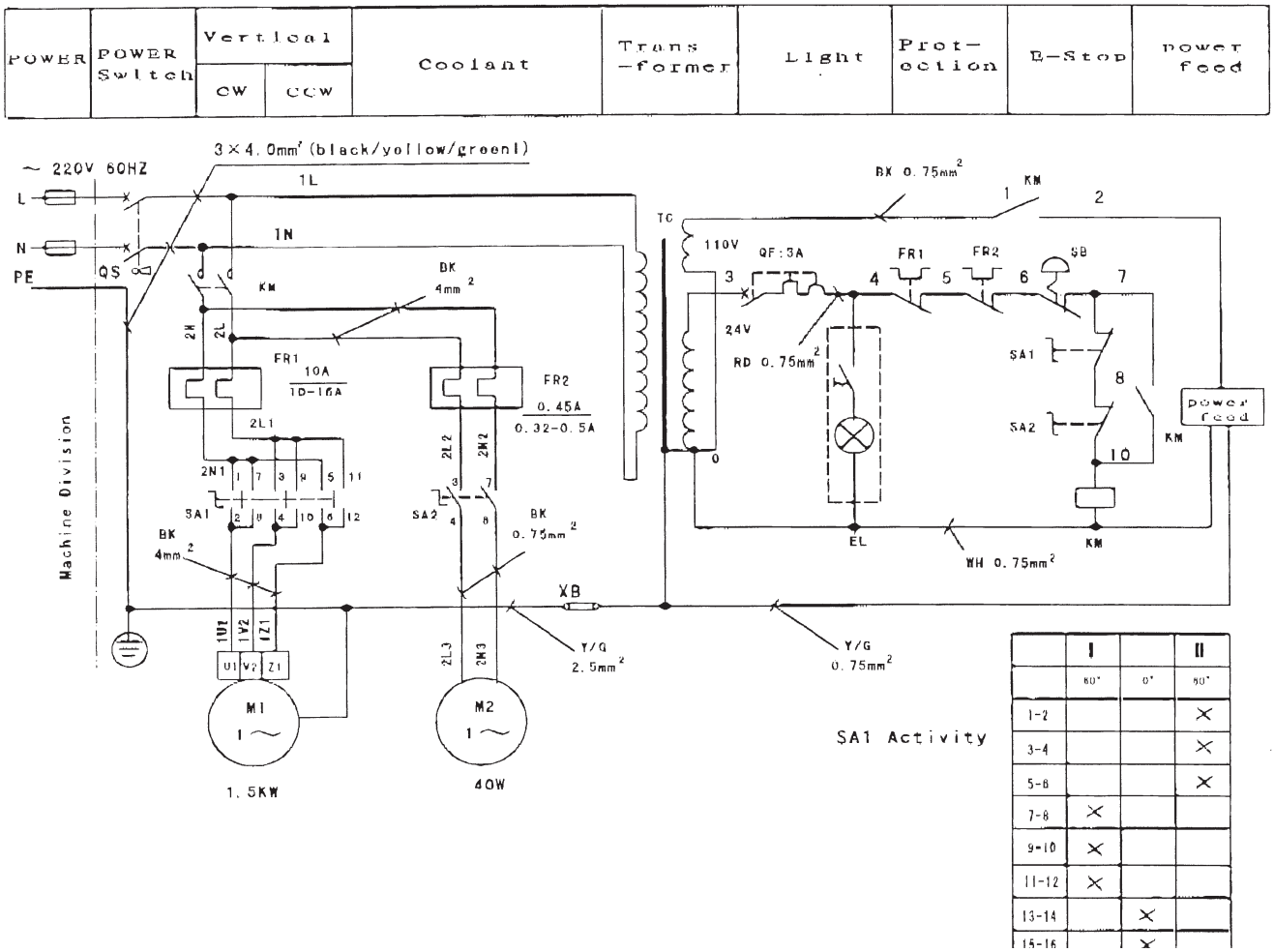
M1008 110V Wiring Diagram



	I		II
	60°	0°	60°
1~2			×
3~4			×
5~6			×
7~8	×		
9~10	×		
11~12	×		
13~14		×	
15~16		×	

CODE	NAME	SPECIFICATIONS
M1	SINGLE-PHASE MOTOR (VERTICAL)	YC1000L2-4 1PH 110V/220V 60HZ 2HP 1725 RPM V1
M2	COOLANT PUMP	YDB-12TH 40W 1PH 110V/220V 60HZ 12L/MIN 3M
A1	POWER FEED	AS-235 AC 110V
KM	AC CONTACTOR	CJX1-32/22 AC 24V 60HZ
QS	MAIN SWITCH	HZ12-40/15
FR1	RELAY	JR16-20/3D LE:20A CURRENT RANGE: 20~32A
FR2	RELAY	JR16-20/3D LE:0.9A CURRENT RANGE 0.68~1.1A
SA1	COMBINATION SWITCH FOR VERTICAL SPINDLE	HZ5C-25/M4D035
SA2	COMBINATION SWITCH FOR COOLANT PUMP	HZ5C-10/M2C005
SB	EMERGENCY STOP BUTTON	LAY3-02ZS/1 2NC
QF	CIRCUIT BREAKER	DZ47-63 (1P 3A)
TC	TRANSFORMER	JBK4-200 1:0-110V 0:0-110V/120VA 0-220V 0-24V/80VA
EL	HALOGEN LAMP	JC-38 (50W AC:24V)

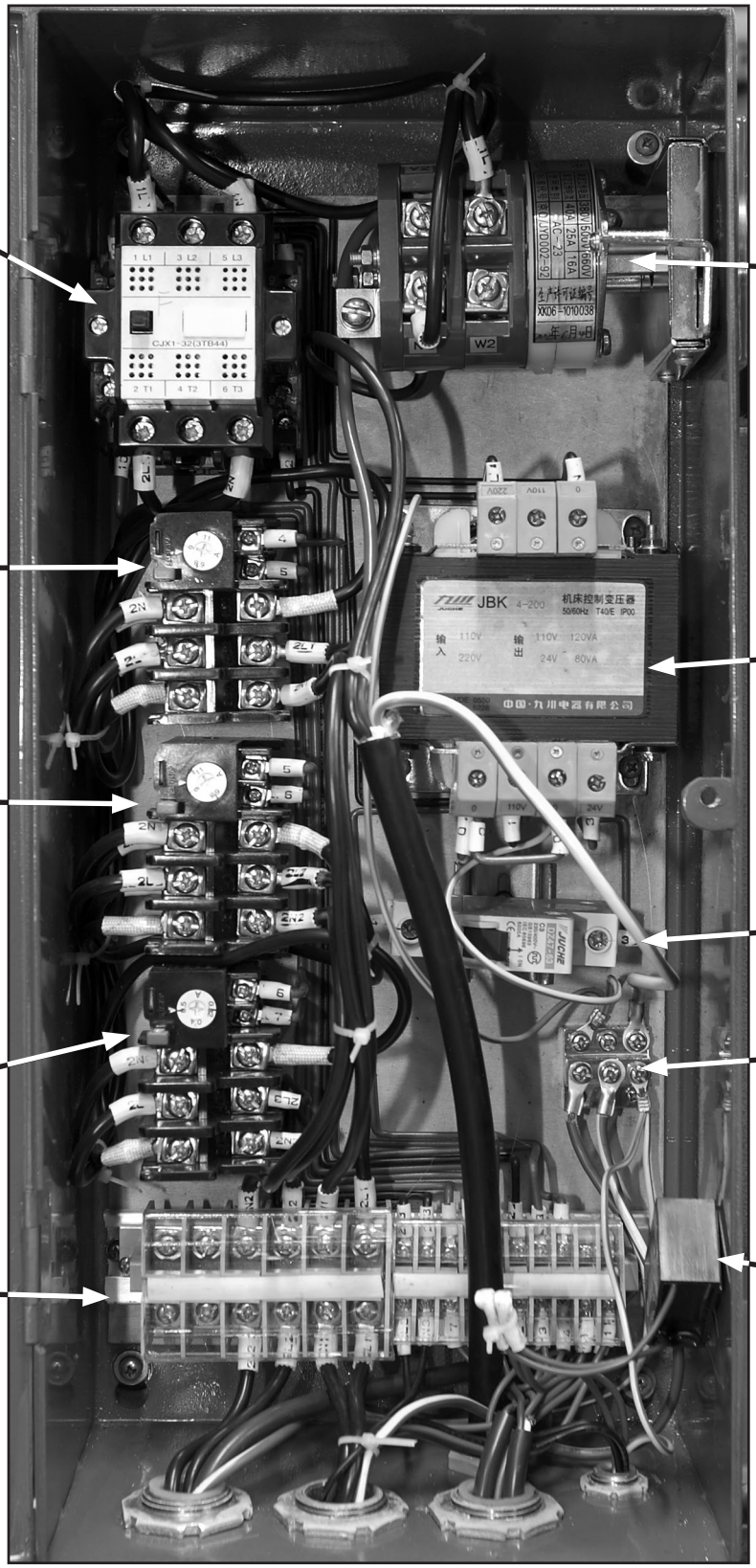
M1008 220V Wiring Diagram



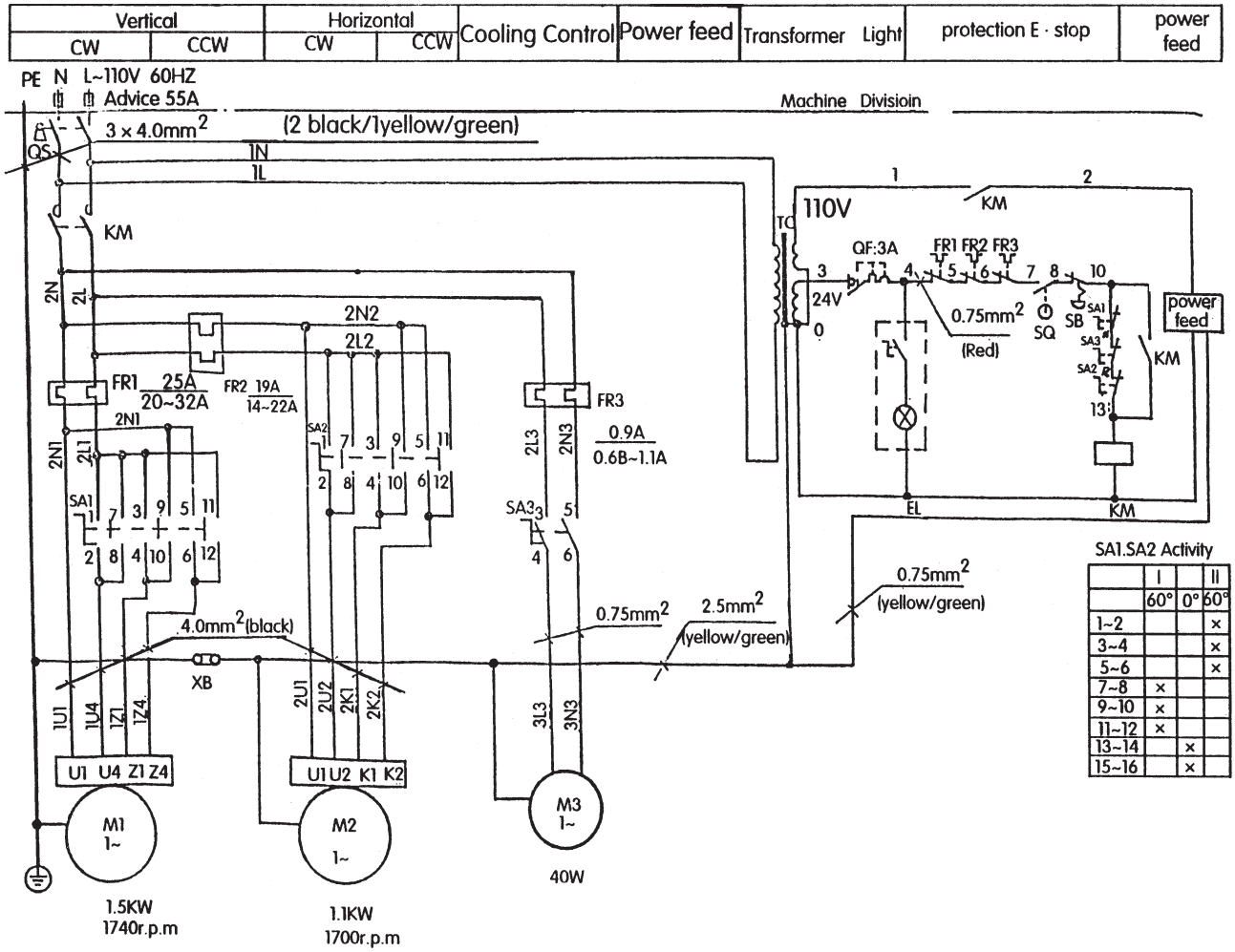
CODE	NAME	SPECIFICATIONS
M1	SINGLE-PHASE MOTOR (VERTICAL)	YC1000L2-4 1PH 110V/220V 60HZ 2HP 1725 RPM V1
M2	COOLANT PUMP	YDB-12TH 40W 1PH 110V/220V 60HZ 12L/MIN 3M
A1	POWER FEED	AS-235 AC 110V
KM	AC CONTACTOR	CJX1-32/22 AC 24V 60HZ
QS	MAIN SWITCH	HZ12-40/15
FR1	RELAY	JR16-20/3D LE:8.5A CURRENT RANGE: 6.8~11A
FR2	RELAY	JR16-20/3D LE:0.45A CURRENT RANGE 0.32~0.5A
SA1	COMBINATION SWITCH FOR VERTICAL SPINDLE	HZ5C-25/M4D035
SA2	COMBINATION SWITCH FOR COOLANT PUMP	HZ5C-10/M2C005
SB	EMERGENCY STOP BUTTON	LAY3-02ZS/1 2NC
QF	CIRCUIT BREAKER	DZ47-63 (1P 3A)
TC	TRANSFORMER	JBK4-200 1:0-110V 0:0-110V/120VA 0-220V 0-24V/80VA
EL	HALOGEN LAMP	JC-38 (50W AC:24V)

SERVICE

M1009 Wiring Box Identification



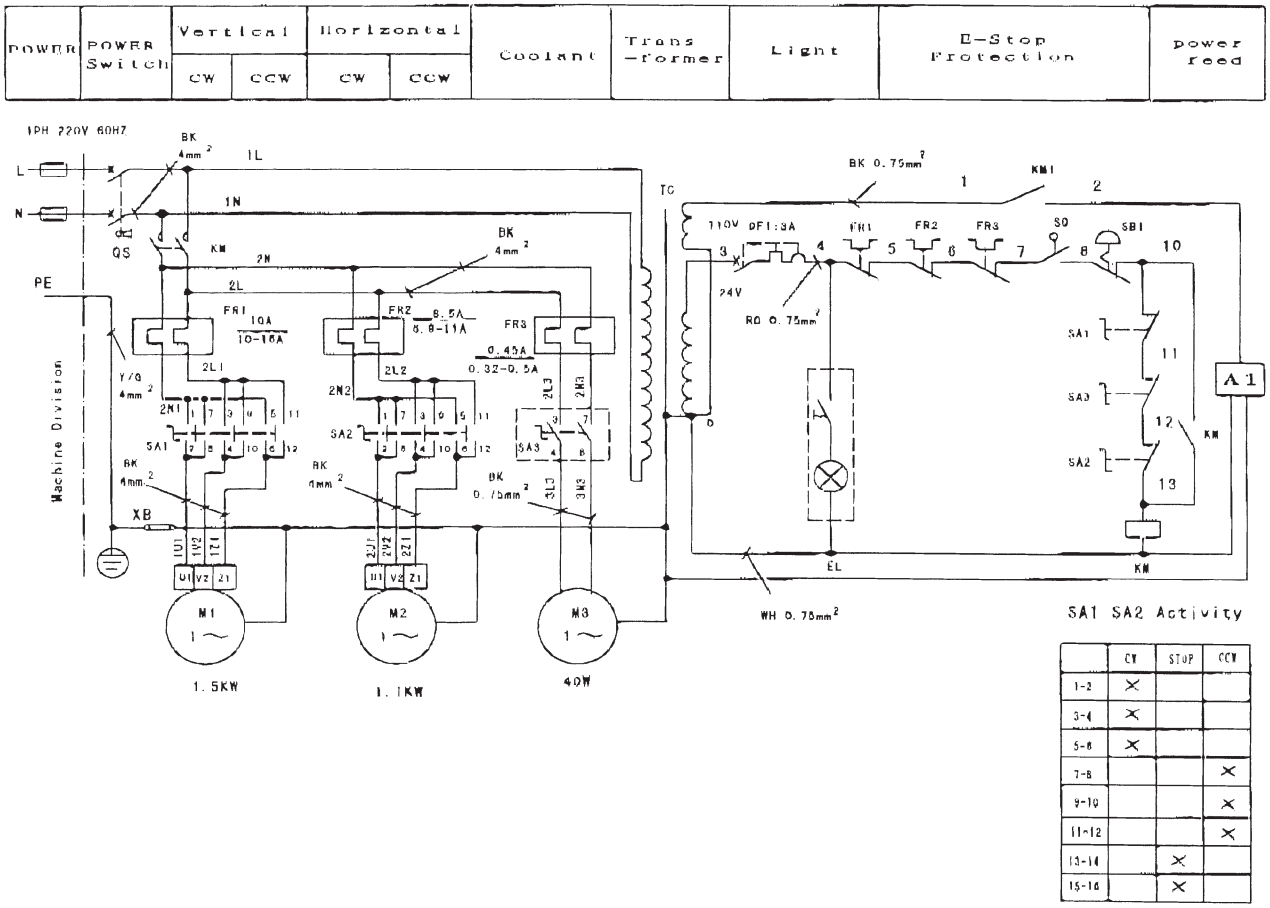
M1009 110V Wiring Diagram



CODE	NAME	SPECIFICATIONS
M1	SINGLE-PHASE MOTOR (VERTICAL)	YC1000L2-4 1PH 110V/220V 60HZ 2HP 1725 RPM V1
M2	SINGLE-PHASE MOTOR (HORIZONTAL)	YC90L2-4 1PH 110V/220V 60HZ 1.5HP 1725 RPM B3
M3	COOLANT PUMP	YDB-12TH 40W 1PH 110V/220V 60HZ 12L/MIN 3M
A1	POWER FEED	AS-235 AC 110V
KM	AC CONTACTOR	CJX1-32/22 AC 24V 60HZ
QS	MAIN SWITCH	HZ12-40/15
FR1	RELAY	JR16-20/3D LE:25A CURRENT RANGE: 20-32A
FR2	RELAY	JR16-20/3D LE:19A CURRENT RANGE: 14~22A
FR3	RELAY	JR16-20/3D LE:0.9A CURRENT RANGE 0.6~1.1A
SA1	COMBINATION SWITCH FOR VERTICAL SPINDLE	HZ5C-25/M4D035v
SA2	COMBINATION SWITCH FOR HORIZONTAL SPINDLE	HZ5C-25/M4D035
SA3	COMBINATION SWITCH FOR COOLANT PUMP	HZ5C-10/M2C005
SB	EMERGENCY STOP BUTTON	LAY3-02ZS/1 2NC
SQ	MICRO SWITCH	LXW6-11DL LE:3A
QF	CIRCUIT BREAKER	DZ47-63 (1P 3A)
TC	TRANSFORMER	JBK4-200 1:0-110V 0:0-110V/120VA 0-220V 0-24V/80VA
EL	HALOGEN LAMP	JC-38 (50W AC:24V)

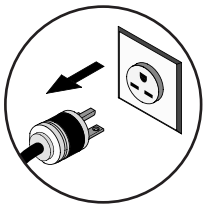
SERVICE

M1009 220V Wiring Diagram



CODE	NAME	SPECIFICATIONS
M1	SINGLE-PHASE MOTOR (VERTICAL)	YC1000L2-4 1PH 110V/220V 60HZ 2HP 1725 RPM V1
M2	SINGLE-PHASE MOTOR (HORIZONTAL)	YC90L2-4 1PH 110V/220V 60HZ 1.5HP 1725 RPM B3
M3	COOLANT PUMP	YDB-12TH 40W 1PH 110V/220V 60HZ 12L/MIN 3M
A1	POWER FEED	AS-235 AC 110V
KM	AC CONTACTOR	CJX1-32/22 AC 24V 60HZ
QS	MAIN SWITCH	HZ12-40/15
FR1	RELAY	JR16-20/3D LE:10A CURRENT RANGE: 6.8~11A
FR2	RELAY	JR16-20/3D LE:8.5A CURRENT RANGE: 6.8~11A
FR3	RELAY	JR16-20/3D LE:0.45A CURRENT RANGE 0.32~0.5A
SA1	COMBINATION SWITCH FOR VERTICAL SPINDLE	HZ5C-25/M4D035
SA2	COMBINATION SWITCH FOR HORIZONTAL SPINDLE	HZ5C-25/M4D035
SA3	COMBINATION SWITCH FOR COOLANT PUMP	HZ5C-10/M2C005
SB	EMERGENCY STOP BUTTON	LAY3-02ZS/1 2NC
SQ	MICRO SWITCH	LXW6-11DL LE:3A
QF	CIRCUIT BREAKER	DZ47-63 (1P 3A)
TC	TRANSFORMER	JBK4-200 1:0-110V 0:0-110V/120VA 0-220V 0-24V/80VA
EL	HALOGEN LAMP	JC-38 (50W AC:24V)

Troubleshooting

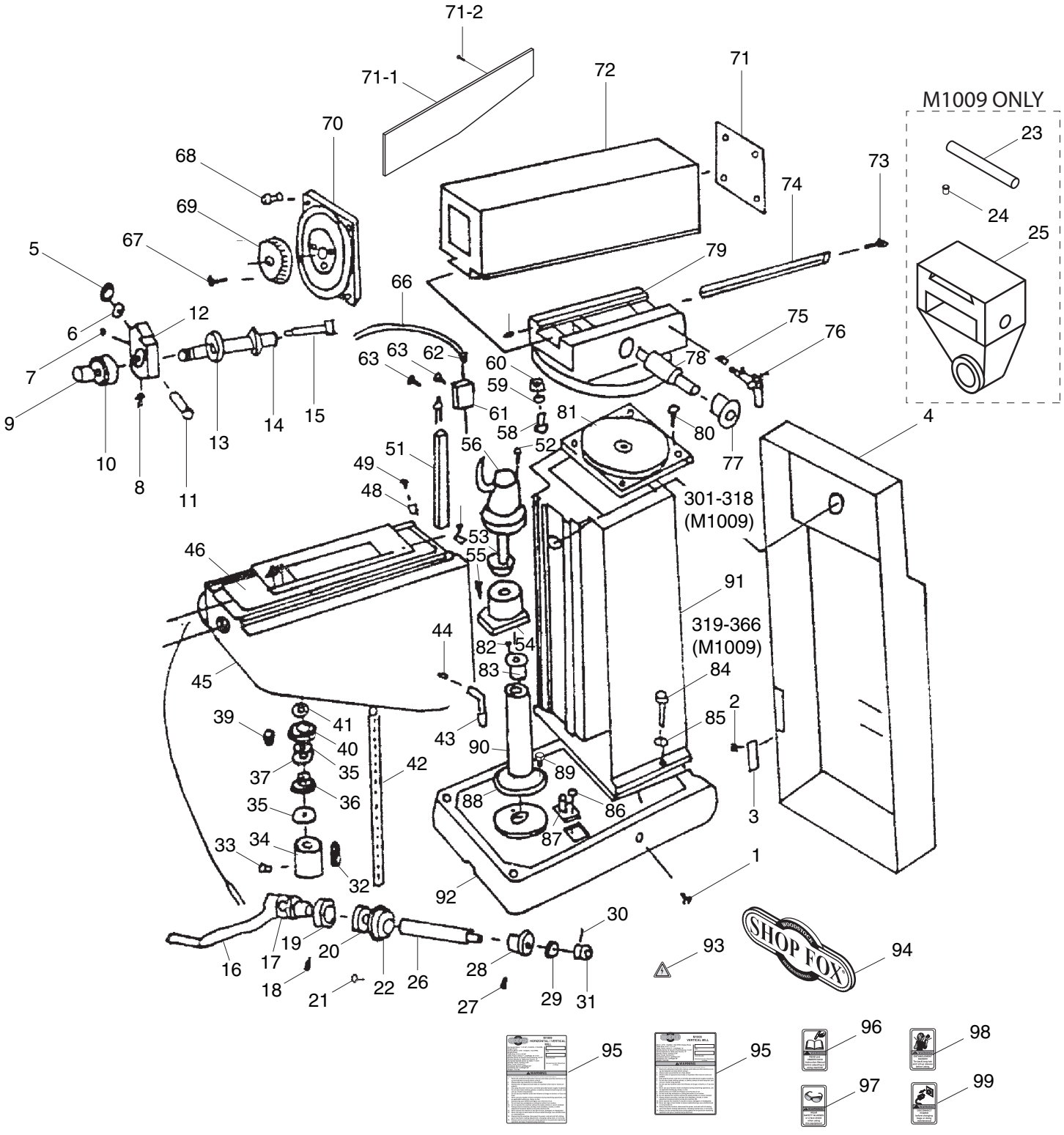


This section covers the most common problems. **WARNING! DO NOT make any adjustments until the mill is unplugged and all moving parts have come to a complete stop.**

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor will not start.	1. Main power switch position. 2. Wiring box door open. 3. Circuit breaker or relay inside machine wiring box tripped. 4. Low voltage. 5. Open circuit in motor or loose connections. 6. Switch at fault. 7. Faulty start capacitor.	1. Make sure main power switch is turned clockwise. 2. Close wiring box door. 3. Reset circuit breaker by flipping switch on then off then back on. Reset relay by pressing the reset button located on the face. 4. Check power supply for proper voltage. 5. Inspect all lead connections on motor and magnetic switch for loose or open connections. 6. Replace switch. 7. Replace start capacitor.
Fuses or circuit breakers trip open.	1. Short circuit in line cord or plug. 2. Short circuit in motor or loose connections. 3. Incorrect fuses or circuit breakers in power supply.	1. Inspect cord or plug for damaged insulation and shorted wires and replace extension cord. 2. Inspect all connections on motor for loose or shorted terminals or worn insulation. 3. Install correct fuses or circuit breakers.
Spindle starts, but coolant pump will not start.	1. Coolant pump relay tripped. 2. Switch at fault. 3. Pump damaged by running without coolant present.	1. Press the reset button on the coolant pump relay. 2. Replace switch. 3. Replace pump.
Tool slips in collet	1. Collet is not fully drawn up into spindle taper. 2. Wrong size collet. 3. Debris in collet or in spindle taper. 4. Taking too big of a cut.	1. Snug up draw bar. 2. Measure tool shank diameter and match with appropriate diameter collet. 3. Remove all oil and debris from collet and spindle taper. 4. Lessen depth of cut and allow chips to clear.
Breaking tools or cutters.	1. RPM and or feed rate is too fast. 2. Cutting tool getting too hot. 3. Taking too big of a cut.	1. Use tables to set correct RPM and feed rates. 2. Use cutting fluid or oil for appropriate application. 3. Lessen depth of cut and allow chips to clear.
Machine is loud when cutting. Overheats or bogs down in the cut.	1. Excessive depth of cut. 2. Dull cutting tools.	1. Decrease depth of cut. 2. Use sharp cutting tools.
Workpiece vibrates or chatters during operation.	1. Table locks not tight. 2. Spindle lock not tight. 3. Workpiece not securely clamped to table or into mill vise. 4. RPM and feed rate too high.	1. Tighten down table locks. 2. Tighten spindle lock. 3. Check that clamping is tight and sufficient for the job. Make sure mill vise is tight to the table. 4. Use appropriate RPM and feed for the job.
Table hard to move.	1. Table locks are tightened down. 2. Chips have loaded up on bedways. 3. Bedways are dry and in need of lubrication. 4. Longitudinal stops are interfering. 5. Gibs are too tight.	1. Check to make sure table locks are fully released. 2. Frequently clean away chips that load up during milling operations. 3. Lubricate bedways and handles. 4. Check to make sure that stops are floating and not hitting the center stop. 5. Loosen gib screw(s))
Micro-feed adjuster won't lower the quill.	1. Quill knob is not tightened down	1. Turn the quill knob clockwise to tighten and engage the micro-feed adjuster.
Bad surface finish	1. Wrong RPM or feed rate. 2. Dull cutting tool or poor cutting tool selection. 3. Wrong rotation of cutting tool.	1. Adjust for appropriate RPM and feed rate. 2. Sharpen cutting tool or select a better cutting tool for the intended operation. 3. Check for proper cutting rotation for cutting tool.

PARTS

Column Breakdown

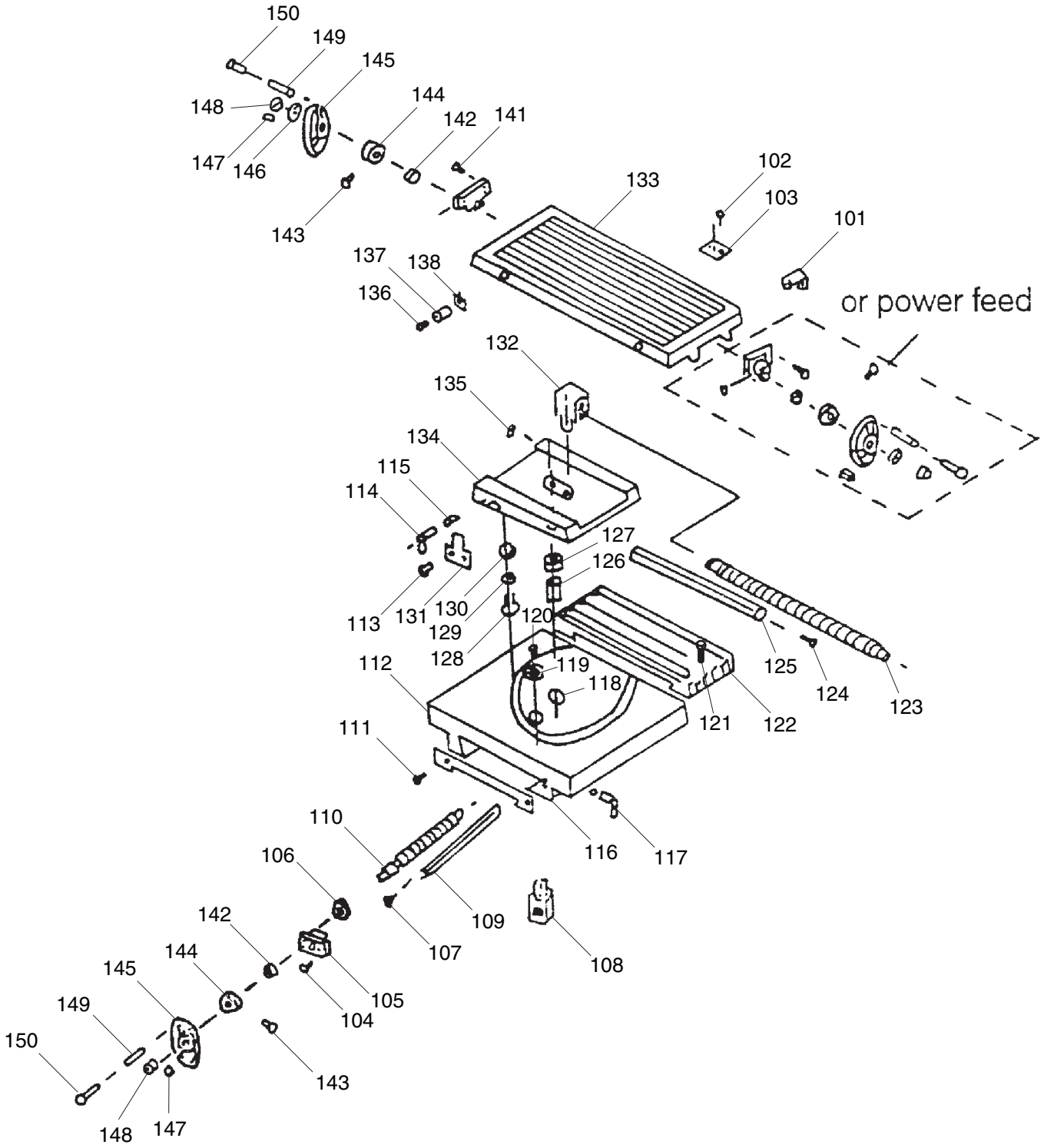


Column Parts List

REF	PART #	DESCRIPTION
1	XPS96M	PHLP HD SCR M10-1.5 x 8 (M1009)
2	XPFH25M	FLAT HD SCR M4-.7 X 12 (M1009)
3	XM1009003	HINGE (M1009)
4	XM1009004	BEHIND COVER (M1009)
5	XPN13M	HEX NUT M16-2 (M1009)
6	XPW08M	FLAT WASHER 16MM (M1009)
7	XM1009007	OIL CUP (M1009)
8	XPSS06M	SET SCREW M8-1.25 x 16 (M1009)
9	XM1009009	SPECIAL NUT M22 X 1.5MM (M1009)
10	XM1009010	COLLAR (M1009)
11	XM1009011	SPECIAL BOLT M16-2 X 218 (M1009)
12	XM1009012	SUPPORT (M1009)
13	XM1009013	CUTTER BAR COLLAR (M1009)
14	XM1009014	TOOLHOLDER (M1009)
15	XM1009015	LIFT BAR (M1009)
16	XM1008016	HANDLE
17	XM1008017	COLLAR
18	XPFH43M	FLAT HD SCR M6-1 X 10
19	XM1008019	SCALE RING
20	XM1008020	BALL BEARING 25 X 42 X 11
21	XPSB114M	CAP SCREW M6-1 x 22
22	XM1008022	COLLAR
23	XM1009023	ADJUSTMENT SCREW (M1009)
24	XM1009024	BALL FITTING (M1009)
25	XM1009025	HORIZ ARBOR SUPPORT (M1009)
26	XM1008026	SHAFT
27	XPSS80M	SET SCREW M8-1.25 x 15
28	XM1008028	COLLAR
29	XPW19M	FLAT WASHER 25MM
30	XPK34M	KEY 5 X 5 X 20
31	XM1008031	CONICAL GEAR
32	XPK09M	KEY 8 X 8 X 36
33	XPSS16M	SET SCREW M8-1.25 X 10
34	XM1008034	HEX NUT 42MM
35	XM1008035	BALL BEARING 25 X 42 X 11
36	XM1008036	COLLAR
37	XM1008037	ADJUST WASHER
39	XPK95M	KEY 6 X 6 X 10
40	XM1008040	CONICAL GEAR
41	XM1008041	CIRCULAR NUT
42	XM1008042	HOIST DESCEND LEAD SCREW
43	XM1008043	CLAMP BOLT M10-1.5 x 58 X 25
44	XM1008044	CLAMP BLOCK
45	XM1008045	KNEE
46	XM1008046	WIPER PLATE
47	XM1008047	WIPER PLATE
48	XM1008048	WIPER PLATE
49	XPS08M	PHLP HD SCR M5-.8 X 12
50	XM1008050	ADJUST SCREW M8-1.25
51	XM1008051	GIB

REF	PART #	DESCRIPTION
52	XPS08M	PHLP HD SCR M5-.8 X 12
53	XM1008053	DUST COVER
54	XM1008054	SUPPORT
55	XPB83M	HEX BOLT M6-1 X 16
56	XM1008056	ELECTRIC PUMP
58	XM1008058	T BOLT M16-2 X 63
59	XPLW10M	LOCK WASHER 16MM
60	XPN13M	HEX NUT M16-2
61	XM1008061	HOLD BRACKET
62	XM1008062	CONNECT TUBE
64	XPSB01M	CAP SCREW M6-1 x 16
65	XM1008065	OIL CUP
66	XM1008066	NOZZLE
67	XPSB123M	CAP SCREW M16-2 X 60
68	XPSB122M	CAP SCREW M16-2 X 50
69	XM1008069	GEAR
70	XM1008070	HOLD BRACKET
71	XM1008071	COVER
71-1	XM1008071-1	SIDE COVER
71-2	XPS09M	PHLP HD SCR M5-.8 X 10
72	XM1008072	OVERARM
73	XPFH42M	FLAT HD SCR M8-1.25 x 40
74	XM1008074	GIB
75	XM1008075	CLAMP BLOCK
76	XM1008076	CLAMP BOLT M12-1.75 X 58 X 25
77	XM1008077	COLLAR
78	XM1008078	FEED SHAFT
79	XM1008079	AROUND BRACKET
80	XPSB77M	CAP SCREW M12-1.75 X 30
81	XM1008081	HOLD SUPPORT
82	XPSB31M	CAP SCREW M8-1.25 x 25
83	XM1008083	COLLAR
84	XPLW10M	LOCK WASHER 16MM
85	XPB131M	HEX BOLT M16-2 X 65
86	XPS38M	PHLP HD SCR M4-.7 x 10
87	XM1008087	CONNECT TUBE
88	XPB116M	HEX BOLT M10-1.5 x 45
89	XPLW06M	LOCK WASHER 10MM
90	XM1008090	ELEVATING SCREW HOUSING
91	XM1008091	COLUMN (M1008)
91	XM1009091	COLUMN (M1009)
92	XM1008092	BASE
93	XLABEL04	LABEL, ELECTRICITY
94	XM1008094	SHOP FOX LOGO PLATE
95	XM1008095	MACHINE ID LABEL (M1008)
95	XM1009095	MACHINE ID LABEL (M1009)
96	XLABEL08	LABEL, READ MANUAL
97	XLABEL01	LABEL, SAFETY GLASSES
98	XLABEL09	LABEL, LOOSE CLOTHING
99	XLABEL02	LABEL, UNPLUG POWER

Rotating Table Breakdown

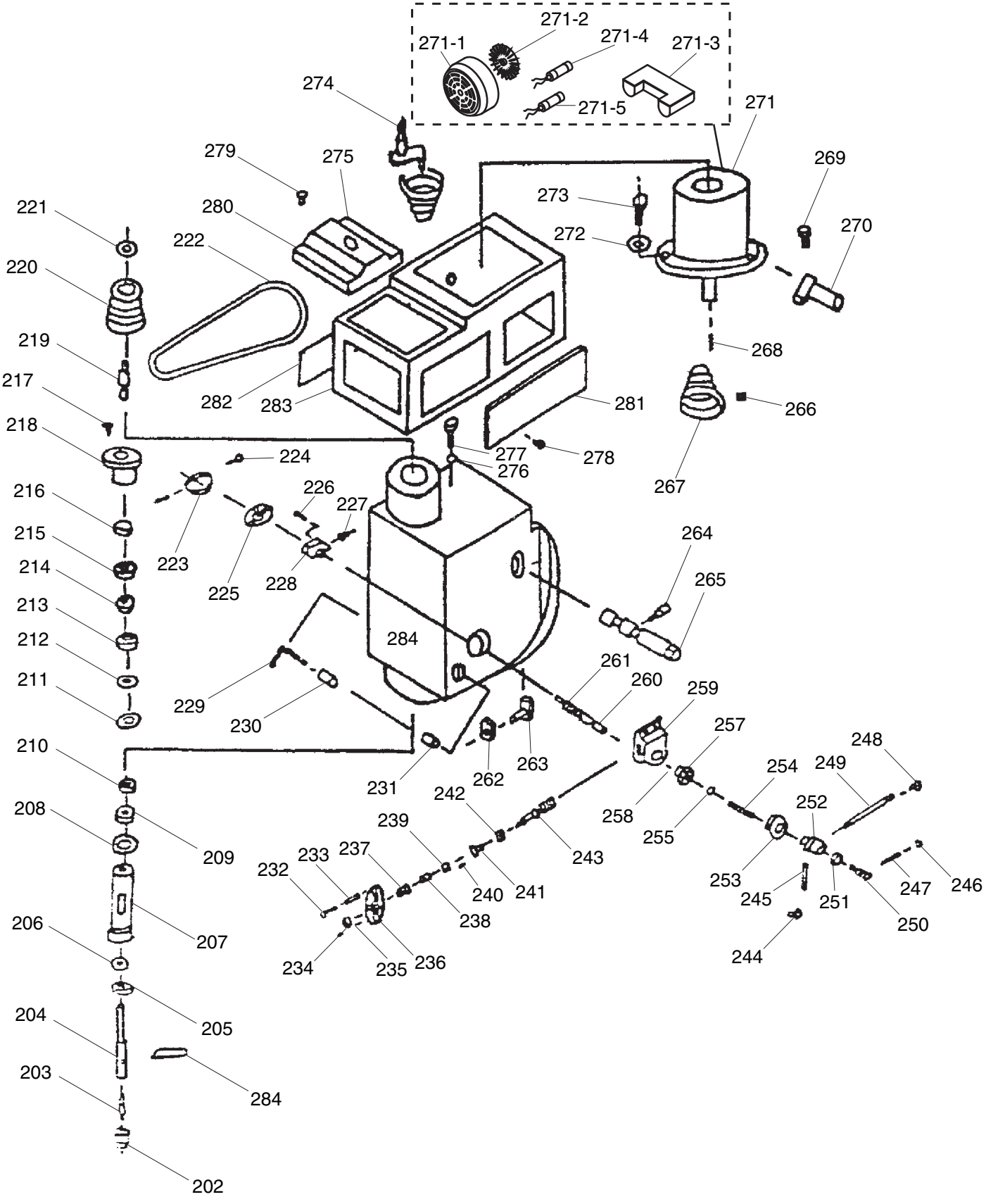


Rotating Table Parts List

REF	PART #	DESCRIPTION
101	XM1008101	CONNECT TUBE
102	XPS05M	PHLP HD SCR M5-.8 x 8
103	XM1008103	OIL COVER
104	XPSB02M	CAP SCREW M6-1 x 20
105	XM1008105	SUPPORT
106	XM1008106	BALL BEARING 17 X 30 X 9
107	XM1008107	ADJUST SCREW M8-1.25
108	XM1008108	SPECIAL NUT 1”
109	XM1008109	SHORT GIB
110	XM1008110	CROSSWISE LEAD SCREW
111	XPS08M	PHLP HD SCR M5-.8 X 12
112	XM1008112	WIPER PLATE
113	XPB03M	HEX BOLT M8-1.25 X 16
114	XM1008114	CLAMP BOLT M10-1.5 x 58 X 25
115	XM1008115	CLAMP BLOCK
116	XM1008116	CLAMP BLOCK
117	XM1008117	CLAMP BOLT M10-1.5 x 58 X 25
118	XM1008118	SADDLE
119	XM1008119	SPECIAL WASHER 32 X 9 X 1.5
120	XM1008120	FLAT HD SCR M8-1.25 x 20
121	XPS68M	SLOT SCREW M6-1 X 12
122	XM1008122	WAY COVER
123	XM1008123	LONGITUDE LEAD SCREW (M1008)
123	XM1009123	LONGITUDE LEAD SCREW (M1009)
124	XM1008124	ADJUST SCREW M8-1.25
125	XM1008125	LONG GIB

REF	PART #	DESCRIPTION
126	XM1008126	SHAFT
127	XM1008127	SHAFT MOUNT
128	XM1008128	T BOLT M12-1.75 X 45
129	XPW06M	FLAT WASHER 12MM
130	XPN09M	HEX NUT M12-1.75
131	XM1008131	LIMIT ASSEMBLY
132	XM1008132	SPECIAL NUT 1”
133	XM1008133	TABLE (M1008)
133	XM1009133	TABLE (M1009)
134	XM1008134	ROTARY BRACKET
135	XM1008135	OIL CUP
136	XPSB01M	CAP SCREW M6-1 X 16
137	XM1008137	DOG
138	XM1008138	SCREW BRACKET
139	XM1008139	OIL CUP
140	XM1008140	SUPPORT
141	XPSB61M	CAP SCREW M10-1.5 x 20
142	XM1008142	BALL BEARING 17 X 30 X 9
143	XPSB04M	CAP SCREW M6-1 X 10
144	XM1008144	SCALE RING
145	XM1008145	HAND WHEEL
146	XPLW05M	LOCK WASHER 12MM
147	XPK96M	KEY 3 X 3 X 20
148	XPN09M	HEX NUT M12-1.75
149	XM1008149	HANDLE COLLAR
150	XM1008150	HANDLE

Headstock Breakdown

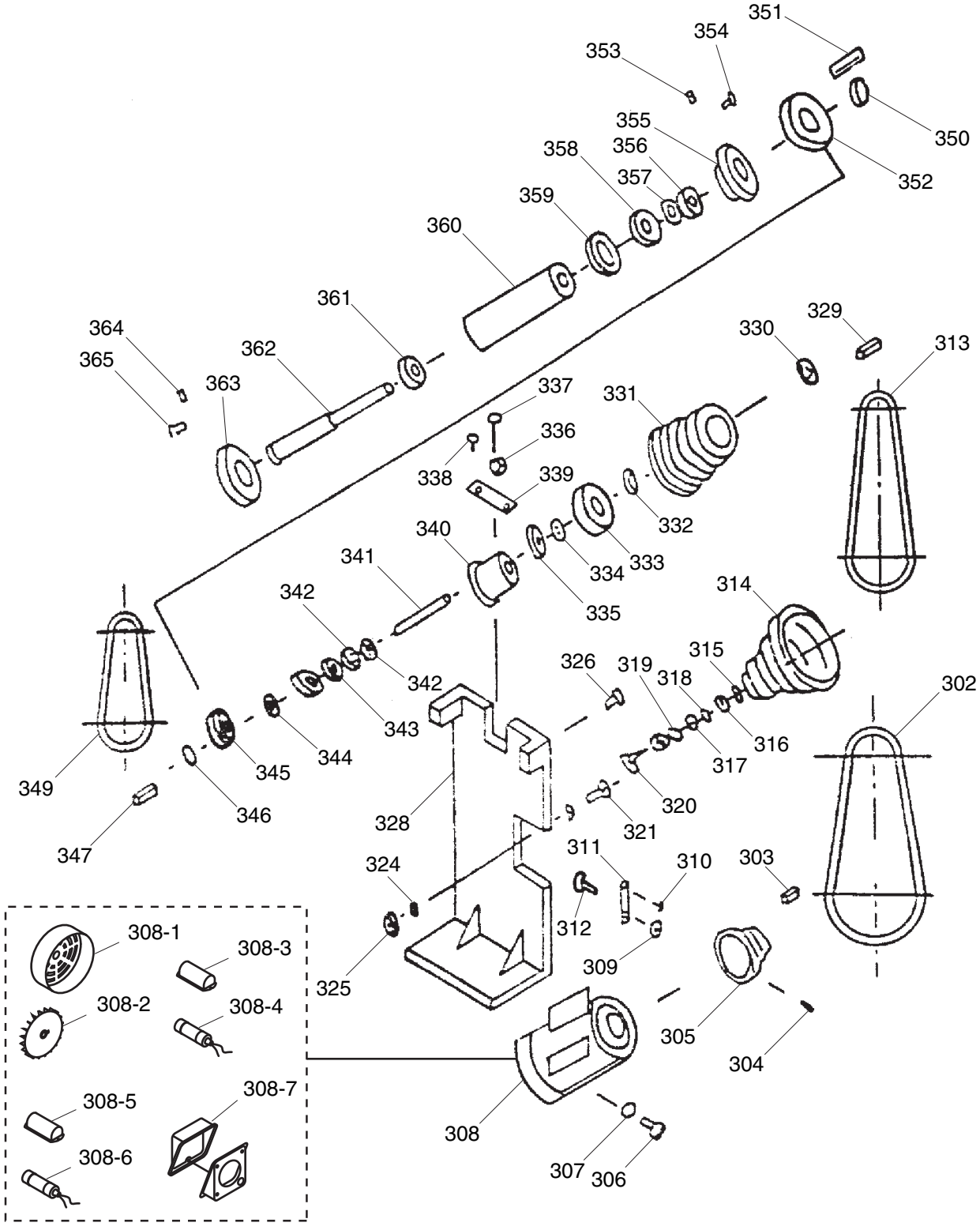


Headstock Parts List

REF	PART #	DESCRIPTION
201	XM1008201	WEDGE SHIFTER
202	XM1008202	DRILL CHUCK
203	XM1008203	SPINDLE BAR
204	XM1008204	SPINDLE
205	XM1008205	DUST COVER
206	XM1008206	BALL BEARING 50 X 80 X 20
207	XM1008207	SLEEVE
208	XP6003	BALL BEARING 6003ZZ
209	XPLW13M	LOCK WASHER 40MM
210	XM1008210	PULLEY NUT
211	XPR56M	EXT RETAINING RING 45MM
212	XPR67M	INT RETAINING RING 75MM
213	XP6003	BALL BEARING 6003ZZ
214	XM1008214	COLLAR
215	XP6003	BALL BEARING 6003ZZ
216	XPR67M	INT RETAINING RING 75MM
217	XPSB01M	CAP SCREW M6-1 X 16
218	XM1008218	COLLAR
219	XM1008219	SPRING SLEEVE
220	XM1008220	SPINDLE PULLEY
221	XM1008221	SLOTTED LOCK NUT M50-1.5MM
222	XPVB75	V-BELT B-75 5L750
223	XPS17M	PHLP HD SCR M4-.7 x 6
224	XM1008224	SPRING CAP
225	XM1008225	SPRING PLATE
226	XPSS19M	SET SCREW M8-1.25 x 30
227	XPS11M	PHLP HD SCR M6-1 X 16
228	XM1008228	SPRING SEAT
229	XM1008229	CLAMP HANDLE
230	XM1008230	CLAMP BLOCK
231	XM1008231	CLAMP BLOCK
232	XPK97M	KEY 4 X 4 X 14
233	XPN26M	ACORN NUT M12-1.75
234	XM1008234	HANDLE
235	XM1008235	HANDLE COLLAR
236	XM1008236	HANDLE WHEEL
237	XM1008237	SCALE RING
238	XM1008238	COLLAR
239	XM1008239	BALL BEARING 15 X 28 X 9
240	XPSB26M	CAP SCREW M6-1 X 12
241	XM1008241	SMALL COVER
242	XM1008242	BALL BEARING 15 X 28 X 9
243	XM1008243	WORM GEAR
244	XM1008244	RIVET

REF	PART #	DESCRIPTION
245	XM1008245	SCALE
246	XM1008246	HANDLE COLLAR
247	XM1008247	HANDLE
248	XM1008248	KNOB M12-1.75
249	XM1008249	HANDLE BAR
250	XPB133M	HEX BOLT M16-2 X 90
251	XM1008251	COVER
252	XM1008252	HANDLE BRACKET
253	XM1008253	SCALE RING
254	XM1008254	SPRING
255	XPR15M	EXT RETAINING RING 30MM
257	XM1008257	BEVEL GEAR
258	XPSB14M	CAP SCREW M8-1.25 x 20
259	XM1008259	WORM BOX
260	XPK09M	KEY 8 X 8 X 36
261	XM1008261	FEED SHAFT
262	XPN13M	HEX NUT M16-2
263	XM1008263	T BOLT M16-2 X 63
264	XPSB13M	CAP SCREW M8-1.25 x 30
265	XM1008265	WORM GEAR
266	XPSS04M	SET SCREW M6-1 X 12
267	XM1008267	MOTOR PULLEY
268	XPK41M	KEY 8 X 8 X 40
269	XPB07M	HEX BOLT M8-1.25 x 25
270	XM1008270	HANDLE
271	XM1008271	MOTOR
271-1	XM1008271-1	MOTOR FAN COVER
271-2	XM1008271-2	MOTOR FAN
271-3	XM1008271-3	CAPACITOR BOX
271-4	XPC150A	S CAPACITOR 150MFD 250VAC
271-5	XPC20A	R CAPACITOR 20MFD 400VAC
272	XPW10M	FLAT WASHER 14MM
273	XPB07M	HEX BOLT M8-1.25 x 25
274	XM1008274	CENTER PULLEY SHAFT
275	XM1008275	CENTER PULLEY
276	XPLW06M	LOCK WASHER 10MM
277	XPB74M	HEX BOLT M10-1.5 x 20
278	XM1008278	KNURLED SCREW M6-1 X 10
279	XPS26M	SLOT HEAD SCREW M6-1 x 20
280	XM1008280	PULLEY COVER
281	XM1008281	RIGHT COVER
282	XM1008282	LEFT COVER
283	XM1008283	MOTOR BASE
284	XM1008284	SPINDLE BOX

M1009 Horizontal Spindle Breakdown

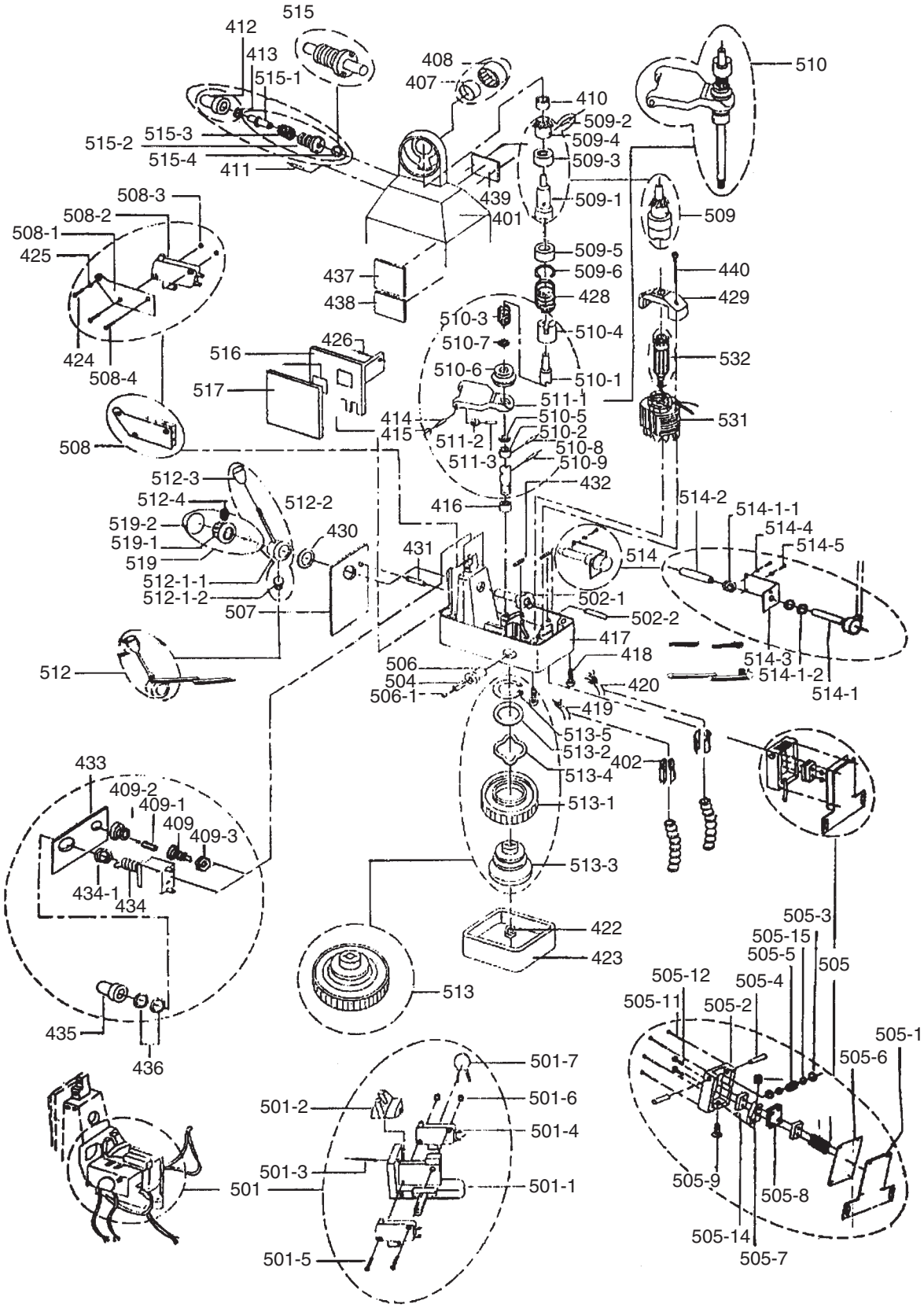


M1009 Horizontal Spindle Parts List

REF	PART #	DESCRIPTION
302	XPVA80	V-BELT A800
303	XPK43M	KEY 8 X 8 X 45
304	XPSS04M	SET SCREW M6-1 X 12
305	XM1009305	MOTOR WHEEL
306	XPB07M	HEX BOLT M8-1.25 x 25
307	XPLW04M	LOCK WASHER 8MM
308	XM1009308	MOTOR
308-1	XM1009308-1	MOTOR FAN COVER
308-2	XM1009308-2	MOTOR FAN
308-3	XM1009308-3	R CAPACITOR COVER
308-4	XPC020B	R CAPACITOR 20MFD 450VAC
308-5	XM1009308-5	S CAPACITOR COVER
308-6	XPC150A	S CAPACITOR 150MFD 250VAC
308-7	XM1009308-7	WIRING BOX
309	XM1009309	SPECIAL NUT M8-1.25
310	XPSB02M	CAP SCREW M6-1 x 20
311	XM1009311	SUPPORT
312	XM1009312	ADJUST SCREW M8-1.25
313	XPVA80	V-BELT A-80 4L800
314	XM1009314	PULLEY
315	XPR21M	INT RETAINING RING 35MM
316	XPR18M	EXT RETAINING RING 17MM
317	XP6003	BALL BEARING 6003ZZ
318	XM1009318	COLLAR
319	XP6003	BALL BEARING 6003ZZ
320	XM1009320	CONNECTOR
321	XM1009321	SMALL SHAFT
322	XPW08M	FLAT WASHER 16MM
323	XPW08M	FLAT WASHER 16MM
325	XPN13M	HEX NUT M16-2
326	XPSB124M	CAP SCREW M12-1.75 X 80
328	XM1009328	MOTOR BASE
329	XM1009329	KEY 8 X 8 X 50
330	XPR11M	EXT RETAINING RING 25MM

REF	PART #	DESCRIPTION
331	XM1009331	PULLEY
332	XPR25M	INT RETAINING RING 47MM
333	XM1009333	SPECIAL NUT M64 X 2
334	XPR11M	EXT RETAINING RING 25MM
335	XPR25M	INT RETAINING RING 47MM
336	XPN02M	HEX NUT M10-1.5
337	XPB13M	HEX BOLT M10-1.5 x 80
338	XPSB02M	CAP SCREW M6-1 x 20
339	XM1009339	SUPPORT
340	XM1009340	COLLAR
341	XM1009341	SMALL SHAFT
342	XM1009342	COLLAR
343	XP6003	BALL BEARING 6003ZZ
344	XP6003	BALL BEARING 6003ZZ
345	XM1009345	WHEEL
346	XPR09M	EXT RETAINING RING 20MM
347	XPK42M	KEY 6 X 6 X 30
349	XM1009349	V BELT A787
350	XPR12M	EXT RETAINING RING 35MM
351	XPK90M	KEY 10 X 10 X 25
352	XM1009352	SPINDLE PULLEY
353	XM1009353	OIL CUP
354	XPSB31M	CAP SCREW M8-1.25 x 25
355	XM1009355	COVER
356	XM1009356	SLOTTED LOCK NUT M39-1.5MM
357	XM1009357	FLAT WASHER 39MM
358	XM1009358	SPECIAL WASHER 52 X 4
359	XM1009359	BALL BEARING 40 X 90 X 25.25
360	XM1009360	COLLAR
361	XM1009361	BALL BEARING 55 X 90 X 23
362	XM1009362	SPINDLE
363	XM1009363	COVER
364	XM1009364	OIL CUP
365	XPSB31M	CAP SCREW M8-1.25 x 25

Power Feed Breakdown



Power Feed Parts List

REF	PART #	DESCRIPTION
401	XM1008401	TOP HOUSING
402	XPN20M	HEX NUT M32-2
403	XPW20M	FLAT WASHER 35MM
404	XM1008404	BEVEL GEAR
405	XPW08M	FLAT WASHER 16MM
406	XPLN09	LOCK NUT M12-1.75
407	XM1008407	INNER RING 20/28
408	XM1008408	NEEDLE BEARING
409	XM1008409	CIRCUIT BREAKER SUPPORT
409-1	XM1008409-1	CIRCUIT BREAKER
409-2	XM1008409-2	CIRCUIT BREAKER COVER
409-3	XPN09M	HEX NUT M12-1.75
410	XM1008410	BUSHING BEARING
411	XM1008411	LIGHT TRANSMITTER
412	XM1008412	HEX SEAL BOOT
413	XPN09M	HEX NUT M12-1.75
414	XM1008414	LIFT FORK SHAFT
415	XM1008415	CRESCENT RING
416	XM1008416	BUSHING BEARING
417	XM1008417	BOTTOM HOUSING
418	XM1008418	SPECIAL SCREW
419	XM1008419	POWER CORD
420	XM1008420	CONTROL CORD
421	XM1008421	CORD CLAMP
422	XM1008422	LOCKING NUT
423	XM1008423	BOTTOM COVER
424	XPS38M	PHLP HD SCR M4-.7 X 10
425	XPN04M	HEX NUT M4-.7
426	XPS17M	PHLP HD SCR M4-.7 X 6
427	XM1008427	ADAPTOR
428	XM1008428	SPRING FOR TOP HOUSING
429	XM1008429	BEARING MOUNT
430	XPLW02M	LOCK WASHER 4MM
431	XPRP76M	ROLL PIN 4 X 16
432	XPSS79M	SET SCREW M4-.7 X 6
433	XM1008433	LABEL
434	XM1008434	ON/OFF SWITCH
434-1	XPN09M	HEX NUT M12-1.75
435	XM1008435	CAP OF ON/OFF SWITCH
436	XPN09M	HEX NUT M12-1.75
437	XM1008437	CAUTION LABEL
438	XM1008438	LABEL
439	XM1008439	LABEL
440	XPS94M	PHLP HD SCR M5-.8 X 75
501	XM1008501	MICRO SWITCH ASSY
501-1	XM1008501-1	MICRO SWITCH HOLDER
501-2	XM1008501-2	SWITCH ACTUATOR
501-3	XM1008501-3	PIN ACTUATOR
501-4	XM1008501-4	MICRO SWITCH

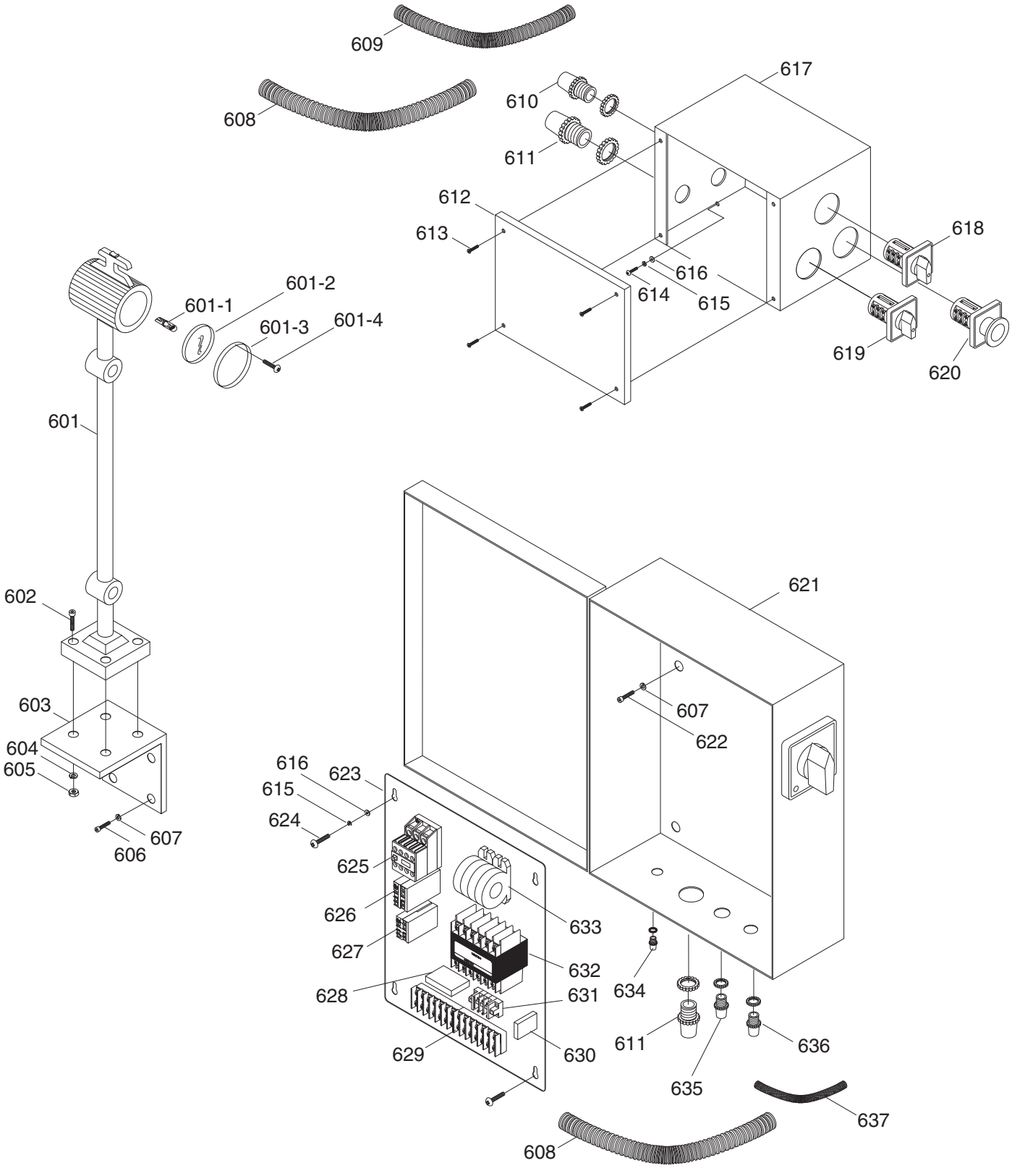
REF	PART #	DESCRIPTION
501-5	XPS95M	PHLP HD SCR M3-.5 X 30
501-6	XPN07M	HEX NUT M3-.5
501-7	XM1008501-7	CAPACITOR
502-1	XM1008502-1	CAM ASSEMBLY
502-2	XPRP11M	ROLL PIN 2.5 X 16
503-1	XM1008503-1	MOTOR FIELD ASSEMBLY
503-2	XM1008503-2	ARMATURE ASSEMBLY
504	XM1008504	BRUSH
505	XM1008505	LIMIT SWITCH ASSEMBLY
505-1	XPN07M	HEX NUT M3-.5
505-1	XM1008505-1	HOLD PLATE
505-2	XM1008505-2	LIMIT SWITCH HOLDER
505-3	XM1008505-3	LIMIT PLATE
505-4	XM1008505-4	ACTUATOR
505-5	XM1008505-5	SPRING
505-6	XM1008505-6	LIMIT SWTCH GASKET
505-7	XM1008505-7	ACTUATOR
505-8	XM1008505-8	CONNECTING PLATE
505-9	XPS12M	PHLP HD SCR M3-.5 X 6
505-11	XPS97M	PHLP HD SCR M3-.5 X 34
505-12	XPS98M	PHLP HD SCR M3-.5 X 16
505-13	XPS59M	PHLP HD SCR M3-.5 X 14
505-14	XM1008505-14	MICRO SWITCH
505-15	XM1008505-15	CRESCENT RING
506	XM1008506	BRUSH HOLDER
506-1	XM1008506-1	BRUSH CAP
507	XM1008507	ON/OFF NAMPLATE
508	XM1008508	MICRO SWITCH ASSEMBLY
508-1	XM1008508-1	MICRO SWITCH HOLDER
508-2	XM1008508-2	MICRO SWITCH
508-3	XPN07M	HEX NUT M3-.5
508-4	XPS59M	PHLP HD SCR M3-.5 X 14
509	XM1008509	DRIVE GEAR ASSEMBLY
509-1	XM1008509-1	DRIVE GEAR SHAFT
509-2	XPRP37M	ROLL PIN 3 X 14
509-3	XP80018	BALL BEARING 80018
509-4	XM1008509-4	DRIVE GEAR
509-5	XM1008509-5	SPACER
509-6	XPR66M	INT RETAINING RING 25MM
510	XM1008510	LIFT FORK ASSEMBLY
510-1	XM1008510-1	DRIVING SHAFT
510-2	XM1008510-2	SHAFT MOUNT
510-3	XM1008510-3	SPRING
510-4	XM1008510-4	CLUTCH
510-5	XPW18M	FLAT WASHER 18MM
510-6	XM1008510-6	BEARING COVER
510-7	XM1008510-7	BEARING
510-8	XPRP02M	ROLL PIN 3 X 16
510-9	XPRP02M	ROLL PIN 3 X 16

Power Feed Parts List (continued)

REF	PART #	DESCRIPTION
511-1	XM1008511-1	LIFTFORK
511-2	XM1008511-2	LIFTFORK RING
511-3	XM1008511-3	PIN, LIFTFORK RING 3 X 14
512-1	XM1008512-1	X CONTROL HANDLE ASSY
512-2	XM1008512-2	Y,Z CONTROL HANDLE ASSY
512-2	XM1008512-2	CONTROL HANDLE
512-3	XM1008512-3	HANDLE KNOB M8-1.25
512-4	XPSS04M	SET SCREW M6-1 X 12
513	XM1008513	ZYTEL GEAR ASSEMBLY
513-1	XM1008513-1	ZYTEL GEAR WITHOUT HUB
513-2	XPW21M	FLAT WASHER 32MM
513-3	XM1008513-3	HUB OF ZYTEL GEAR
513-4	XM1008513-4	LOCK WASHER 38MM
513-5	XPR29M	INT RETAINING RING 32MM
514-1	XM1008514-1	POTENTIOMETER ASSEMBLY
514-2	XM1008514-2	POTENTIOMETER RING
514-3	XM1008514-3	POTENTIOMETER STRAIN
514-4	XPW05M	FLAT WASHER 4MM
514-5	XPS17M	PHLP HD SCR M4-.7 X 6
515	XM1008515	RAPID SWITCH BUTTON
515-1	XM1008515-1	RAPID SWITCH PLUNGER

REF	PART #	DESCRIPTION
515-2	XM1008515-2	RAPID SWITCH HOUSING
515-3	XM1008515-3	SPRING FOR RAPID SWITCH
515-4	XPEC13M	E-CLIP 5MM
516	XM1008516	CIRCUIT BOARD ASSEMBLY
517	XM1008517	CIRCUIT BOARD INSULATOR
518	XM1008518	TRAVEL STOP ASSEMBLY
518-1	XM1008518-1	TRAVEL STOP
518-2	XM1008518-2	TRAVEL STOP BASE
518-3	XM1008518-3	TRAVEL STOP SHAFT
518-4	XM1008518-4	SPRING
518-5	XPB07M	HEX BOLT M8-1.25 X 25
518-6	XM1008518-6	SPACER
518-7	XPR39M	EXT RETAINING RING 8MM
519	XM1008519	SPEED CONTROL KNOB ASSY
519-1	XM1008519-1	SPEED CONTROL KNOB M6-1
519-2	XM1008519-2	SPEED CONTROL LABEL
519-3	XPSS49M	SET SCREW M4-.7 X 16
512-1-1	XM1008512-1-1	X CONTROL HANDLE DISC
512-1-2	XM1008512-1-2	Y,Z CONTROL HANDLE DISC
514-1-1	XPN03M	HEX NUT M8-1.25
514-1-2	XM1008514-1-2	POTENTIOMETER WASHER

M1008 Electrical Components Breakdown

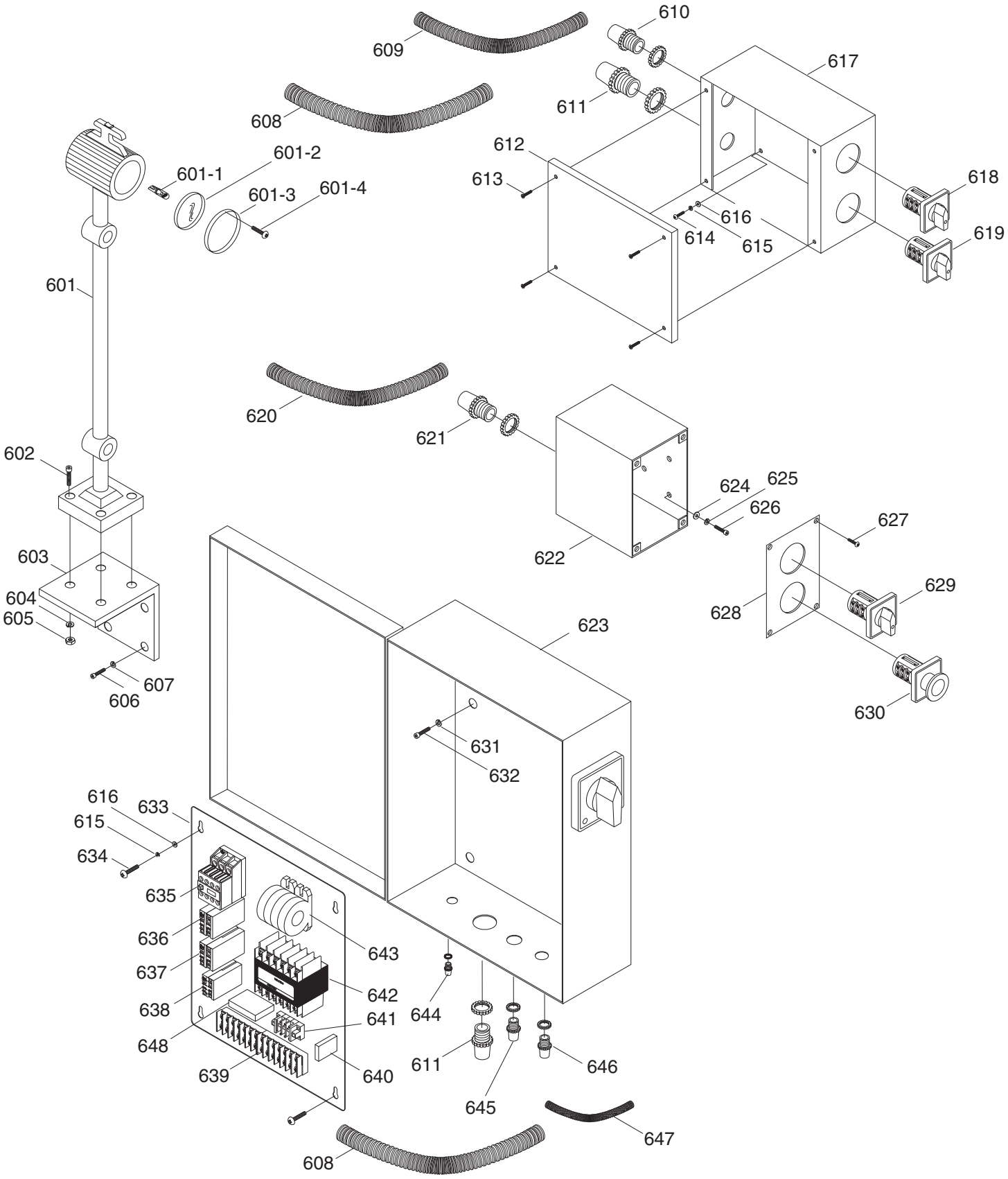


M1008 Electrical Components Parts List

REF	PART #	DESCRIPTION
601	XM1008601	HALOGEN LAMP
601-1	XM1008601-1	BULB
601-2	XM1008601-2	BULB COVER
601-3	XM1008601-3	BULB COVER RETAINER
601-4	XPS55M	PHLP HD SCR M3-.5 X 10
602	XPSB01M	CAP SCREW M6-1 x 16
603	XM1008603	LAMP MOUNTING BRACKET
604	XPLW01M	LOCK WASHER 5MM
605	XPN06M	HEX NUT M5-.8
606	XPSB01M	CAP SCREW M6-1 x 16
607	XPLW01M	LOCK WASHER 5MM
608	XM1008608	CONDUIT 20MM
609	XM1008609	CONDUIT 15MM
610	XM1008610	STRAIN RELIEF 20MM
611	XM1008611	STRAIN RELIEF 25MM
612	XM1008612	VERTICAL SWITCH BOX COVER
613	XPFH31M	FLAT HD SCR M4-.7 X 8
614	XPS08M	PHLP HD SCR M5-.8 X 12
615	XPLW01M	LOCK WASHER 5MM
616	XPW02M	FLAT WASHER 5MM
617	XM1008617	VERTICAL SWITCH BOX

REF	PART #	DESCRIPTION
618	XM1008618	VERT SPINDLE SWITCH M4D035
619	XM1008619	COOLANT PUMP SWITCH M2C005
620	XM1008620	E-STOP BUTTON LAY3-02ZS/1
621	XM1008621	MAIN WIRING BOX W/LATCH
622	XPSB33M	CAP SCREW M5-.8 X 12
623	XM1008623	ELECTRICAL BOARD
624	XPS09M	PHLP HD SCR M5-.8 X 10
625	XM1008625	CONTACTOR CJX1-32/22 24V
626	XM1008626	RELAY JR16-20/3D 6.8-11A
627	XM1008627	RELAY JR16-20/3D 0.32-0.5A
628	XM1008628	CIRCUIT BREAKER DZ47-63(1P,3A)
629	XM1008629	MAIN TERMINAL BAR (2 PC.)
630	XM1008630	PUMP CAPACITOR 2MFD 450VAC
631	XM1008631	GROUNDING TERMINAL BAR
632	XM1008632	TRANSFORMER
633	XM1008633	MAIN SWITCH W/KNOB
634	XM1008634	STRAIN RELIEF 6.5MM
635	XM1008635	STRAIN RELIEF 15MM
636	XM1008636	STRAIN RELIEF 13MM
637	XM1008637	CONDUIT 10MM

M1009 Electrical Components Breakdown



PARTS

M1009 Electrical Components Parts List

REF	PART #	DESCRIPTION
601	XM1008601	HALOGEN LAMP
601-1	XM1008601-1	BULB
601-2	XM1008601-2	BULB COVER
601-3	XM1008601-3	BULB COVER RETAINER
601-4	XPS55M	PHLP HD SCR M3-.5 X 10
602	XPSB33M	CAP SCREW M5-.8 X 12
603	XM1008603	LAMP MOUNTING BRACKET
604	XM1008604	LOCK WASHER 5MM
605	XPN06M	HEX NUT M5-.8
606	XM1008606	CAP SCREW M5
607	XPLW01M	LOCK WASHER 5MM
608	XM1008608	CONDUIT 20MM
609	XM1008609	CONDUIT 15MM
610	XM1008610	STRAIN RELIEF 20MM
611	XM1008611	STRAIN RELIEF 25MM
612	XM1008612	VERTICAL SWITCH BOX COVER
613	XPFH31M	FLAT HD SCR M4-.7 X 8
614	XPS08M	PHLP HD SCR M5-.8 X 12
615	XPLW01M	LOCK WASHER 5MM
616	XPW02M	FLAT WASHER 5MM
617	XM1009617	VERTICAL SWITCH BOX
618	XM1008618	VERT SPINDLE SWITCH M4D035
619	XM1008619	COOLANT PUMP SWITCH M2C005
620	XM1008609	CONDUIT 15MM
621	XM1008610	STRAIN RELIEF 20MM
622	XM1009622	HORIZONTAL SWITCH BOX

REF	PART #	DESCRIPTION
623	XM1008623	MAIN WIRING BOX W/LATCH
624	XPW02M	FLAT WASHER 5MM
625	XPLW01M	LOCK WASHER 5MM
626	XPSB33M	CAP SCREW M5-.8 X 12
627	XPS07M	PHLP HD SCR M4-.7 X 8
628	XM1009628	HORZ SWITCH BOX COVER
629	XM1008618	HORIZ SPINDLE SWITCH M4D035
630	XM1008620	E-STOP BUTTON LAY3-02ZS/1
631	XPLW01M	LOCK WASHER 5MM
632	XPS09M	PHLP HD SCR M5-.8 X 10
633	XM1009633	ELECTRICAL BOARD
634	XPS09M	PHLP HD SCR M5-.8 X 10
635	XM1008625	CONTACTOR CJX1-32/22 24V
636	XM1008626	RELAY JR16-20/3D 6.8-11A
637	XM1008626	RELAY JR16-20/3D 6.8-11A
638	XM1008627	RELAY JR16-20/3D 0.32-0.5A
639	XM1008629	MAIN TERMINAL BAR (2 PC.)
640	XM1008630	PUMP CAPACITOR 2MFD 450VAC
641	XM1008631	GROUNDING TERMINAL BAR
642	XM1008632	TRANSFORMER
643	XM1008633	MAIN SWITCH W/KNOB
644	XM1008634	STRAIN RELIEF 6.5MM
645	XM1008635	STRAIN RELIEF 15MM
646	XM1008636	STRAIN RELIEF 13MM
647	XM1008637	CONDUIT 10MM
648	XM1008628	CIRCUIT BREAKER DZ47-63(1P,3A)

Warranty

Woodstock International, Inc. warrants all **SHOP FOX®** machinery to be free of defects from workmanship and materials for a period of 2 years from the date of original purchase by the original owner. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, lack of maintenance, or to repairs or alterations made or specifically authorized by anyone other than Woodstock International, Inc.

Woodstock International, Inc. will repair or replace, at its expense and at its option, the **SHOP FOX®** machine or machine part which in normal use has proven to be defective, provided that the original owner returns the product prepaid to the **SHOP FOX®** factory service center or authorized repair facility designated by our Bellingham, WA office, with proof of their purchase of the product within 2 years, and provides Woodstock International, Inc. reasonable opportunity to verify the alleged defect through inspection. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Woodstock International Inc.'s warranty, then the original owner must bear the cost of storing and returning the product.

This is Woodstock International, Inc.'s sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant that **SHOP FOX®** machinery complies with the provisions of any law or acts. In no event shall Woodstock International, Inc.'s liability under this warranty exceed the purchase price paid for the product, and any legal actions brought against Woodstock International, Inc. shall be tried in the State of Washington, County of Whatcom. We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages arising from the use of our products.

Every effort has been made to ensure that all **SHOP FOX®** machinery meets high quality and durability standards. We reserve the right to change specifications at any time because of our commitment to continuously improve the quality of our products.

WARRANTY REGISTRATION

Name_____

Street _____

City _____ State_____ Zip_____

Phone #_____ Email _____ Invoice #_____

Model #_____ Serial #_____ Dealer Name_____ Purchase Date_____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. ***Of course, all information is strictly confidential.***

1. How did you learn about us?
_____ Advertisement ____ Friend ____ Local Store
_____ Mail Order Catalog ____ Website ____ Other:

2. How long have you been a woodworker/metalworker?
_____ 0-2 Years _____ 2-8 Years ____ 8-20 Years _____ 20+ Years

3. How many of your machines or tools are **Shop Fox®**?
_____ 0-2 _____ 3-5 ____ 6-9 _____ 10+

4. Do you think your machine represents a good value? _____ Yes ____ No

5. Would you recommend **Shop Fox®** products to a friend? _____ Yes ____ No

6. What is your age group?
_____ 20-29 ____ 30-39 ____ 40-49
_____ 50-59 ____ 60-69 ____ 70+

7. What is your annual household income?
_____ $20,000-$29,000 ____ $30,000-$39,000 ____ $40,000-$49,000
_____ $50,000-$59,000 ____ $60,000-$69,000 ____ $70,000+

8. Which of the following magazines do you subscribe to?

____ Cabinet Maker
____ Family Handyman
____ Hand Loader
____ Handy
____ Home Shop Machinist
____ Journal of Light Cont.
____ Live Steam
____ Model Airplane News
____ Modeltec
____ Old House Journal
____ Popular Mechanics
____ Popular Science
____ Popular Woodworking
____ Practical Homeowner
____ Precision Shooter
____ Projects in Metal
____ RC Modeler
____ Rifle
____ Shop Notes
____ Shotgun News
____ Today's Homeowner
____ Wood
____ Wooden Boat
____ Woodshop News
____ Woodsmith
____ Woodwork
____ Woodworker West
____ Woodworker's Journal
____ Other:

9. Comments:_____

_____

_____

_____

_____

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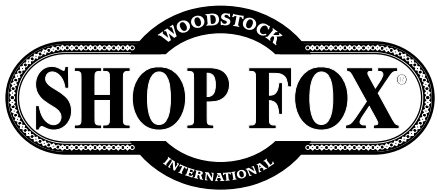

WOODSTOCK INTERNATIONAL INC.
P.O. BOX 2309
BELLINGHAM, WA 98227-2309

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